THE CASAMERO COMMUNITY IN THE RED MESA VALLEY OF NORTHWESTERN NEW MEXICO

compiled and edited by
Frances Joan Mathien

Archaeological Society of New Mexico
Special Publication No. 4

New Mexico Bureau of Land Management
Cultural Resources Series Monograph No. 17

2010

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with contributions by

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Randy A. Harper
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CHAPTER 1

THE CASAMERO COMMUNITY AND THE CHACO WORLD

Frances Joan Mathien

Beginning in the last half of the twentieth century, archaeological research in the southwestern United States rapidly increased our knowledge of architectural and artifactual evidence that suggests early farming peoples were integrated into regional systems (Cordell 1984). One of these is described as the Chaco World (Kantner and Kintigh 2006). It is comprised of numerous large and small sites, many of which represent communities that are located in northwestern New Mexico, parts of northeastern Arizona, southeastern Utah, and southwestern Colorado. Within this area the great houses of Chaco Canyon, with their remarkable architectural style, great kivas, roads, and other unusual features, provided a template for similar construction (often at a much smaller scale) during the period from A.D. 1000 to 1150 (Kantner and Kintigh 2006:154-155).

Research specifically designed to define the Chaco World outside of Chaco Canyon began in earnest with the initiation of two major surveys of great houses (Marshall et al. 1979; Powers et al. 1983). The presence of great houses, great kivas, and roads and their related features were documented throughout the San Juan Basin and its peripheries. Powers et al. (1983) also conducted three areal surveys around the larger sites at Bis sa'ani, Peach Springs, and Pierre's to better understand the relationship of small habitation sites and the "Chacoan" great houses and associated features in communities, which were defined as "an aggregation of contemporaneous sites occurring within a small, circumscribed area, with a site density exceeding that of the surrounding areas (Powers et al. 1983:14). Some great houses are not part of a local community; these are located along a major road system and are thought to have specific road related functions (Marshall et al. 1979). Later we would learn that other communities consist of only small sites (see discussion of Blue J in Chapter 10).

Since these surveys were conducted, other scholars continue to identify and report on more than 200 great houses and/or communities located throughout the region (Breternitz et al. 1983; Cameron 2009; Doyel 2001; Irwin-Williams and Shelley 1980; Kantner and Mahoney 2000; Malville and Matlock 1993; Reed 2006, 2008; Reed and Hensler 1999; Varien and Wilshusen 2002). We are now beginning to understand the differences among communities in any one area of the Chaco World, how the "outlying" communities interacted with each other and with sites in Chaco Canyon, and how these relationships changed through time.

This special joint report by the Archaeological Society of New Mexico and the Bureau of Land Management focuses on the Casamero community, an Ancestral Pueblo settlement on the eastern edge of the Red Mesa Valley of west central New Mexico during the Bonito Phase (A.D. 900-1150) (Figure 1.1). Although summary descriptions of Casamero have been published (e.g., Marshall et al. 1979:134, 293; Nials et al. 1983:153), a more extensive report on the investigations carried out at the great house, a survey of the related small sites, and their relationship within the Chaco World is not readily available. The goal of this volume is to provide in a single record what was recovered from excavations and stabilization of the great house, the survey in the immediate area, and to evaluate the community's role in the local region, as well as suggestions as to how this settlement related to

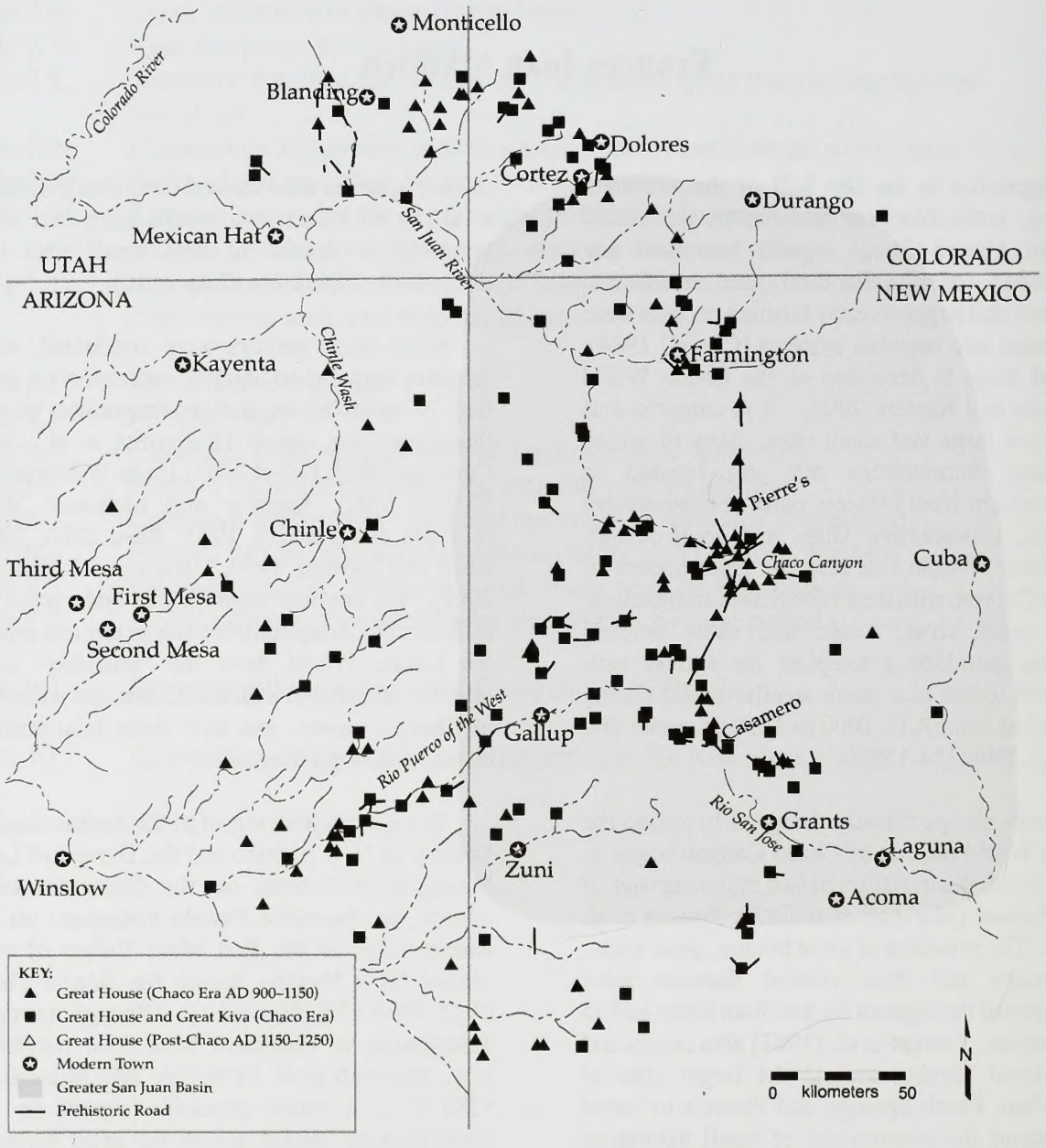

Figure 1.1. Location of the Casamero community within the Chaco World. (From John Kantner.)

Chaco Canyon during its florescence as was suggested by Vivian (1990) in his comprehensive study of the Pueblo occupation of the San Juan Basin.

History of Research on the Casamero Community

The existence of Casamero Pueblo has been known for well over a century (Lister and Lister 1981:133-134), but its role in the Chaco World was not clearly recognized until more recently. It is recorded as LA 8779 in the New Mexico Archaeological Resources Management System; AR-NM-01-144 or AR-30-144 by the Bureau of Land Management; 29MC186, the Smithsonian Institution number assigned by the National Park Service Chaco Project; and possible as "Casa Morena" by Holsinger (1901).

During his investigations into the Hyde Exploring Expedition's excavations at Pueblo Bonito in Chaco Canyon, Holsinger (1901) made a reconnaissance of the San Juan Basin. The large number of sites found therein led him to propose that a large section of northwestern New Mexico be set aside to protect these sites. Only a fraction of this territory, however, was set aside as Chaco Canyon National Monument in 1907. The importance of the great houses was not formally recognized by the federal government until 1980 when the monument was renamed Chaco Culture National Historical Park and protection was extended to 33 of the known outlying communities (including Casamero) where large pueblos, often surrounded by small house sites, have been located.

It was in the 1960s that archaeologists' attention focused specifically on Casamero Pueblo. Circumstantial evidence indicates non-professional exploitation of this resource when Howard Elam set up a shack near Casamero Pueblo in the mid-1960s. Elam was known as a guide for private citizens who wanted to experience the discovery of archaeological materials. Sigleo (1981; Chapter 4 of this volume) and Neller (1978; Chapter 5 of this volume) indicate that the fill in Rooms 2 and 4, and parts of Rooms 6, 18, 19, and 20 had been disturbed, probably between 1963 and 1966. Such unauthorized excavation without proper recording and preservation of notes, maps, and artifacts is an example of destruction of archaeological sites that deprives everyone of the opportunity to better understand the people who lived in this community.

In contrast, ensuing excavation and stabilization reports do provide a record of what was recovered in other rooms and suggestions as to how this site related to the great houses in Chaco Canyon. Excavation of Casamero Pueblo in 1966 and 1967 by the Cottonwood Gulch Foundation provided an opportunity for some young members of the interested public to learn about and participate in archaeological research. Founded in 1926 by Hillis Howie, the Cottonwood Gulch Foundation is based in Albuquerque and holds summer field sessions in the vicinity of Thoreau, NM. It provides a limited number of teenaged students an opportunity to learn about several fields of study during a two-week experience. The archaeology sessions emphasize field inventory, artifact handling, and other related techniques. Data gathered under the direction of Anne Sigleo during the two years when the foundation worked at Casamero (Sigleo 1966, 1967) was updated by a week of field work by Sigleo in 1974 and combined into a final report (Sigleo 1981) that is included here as Chapter 4.

Once excavations were completed, the Bureau of Land Management, on whose land the site is located, focused on stabilization of the ruin, as well as evaluated its potential as an outdoor exhibit of a Chaco great house (Lutonsky 1976). Stabilization was carried out in the summer of 1976; later that year Earl Neller, the newly appointed Bureau of Land Management Stabilization Archaeologist, had the opportunity to evaluate the research design, the field notes, and

other data collected at that time. He also studied material from Sigleo's excavations and perused a survey report by Smith (1964, and summarized in Smith 1965) on an area south of Casamero along I-40 to address current research questions. Neller's discussion of the importance of an anthropological perspective during stabilization and the results of his analysis (Neller 1978; and included as part of Lester and Neller 1978) are presented in Chapter 5.

Several other surveys have been conducted in and around the Casamero community since that time. Whitmore and Schaafsma (1979) surveyed an area to the south and west of Casamero Pueblo for Plains Electric. Their data were available to Marshall et al. (1979) when they examined Ancestral Pueblo communities in the San Juan Basin. Powers et al. (1983) included the Casamero community in their analysis of Chaco communities. During the Chaco roads survey, Bureau of Land Management archaeologists evaluated and recorded two linear segments in the immediate area (Nials 1983:153). Vivian (1990: Figure 8.40) illustrates the postulated Chaco road network in which Casamero is linked to the Andrews Site located just to the east across Casamero Draw. Whether this road network was created as a means for transportation, communication, or other functions (Obenauf 1980) has more recently been called into question (Kantner 1997; Roney 1992), making it even more critical to preserve and understand each community within its local setting, the larger subregion (e.g., the Red Mesa Valley), and the Chaco World (Kantner and Kintigh 2006).

Once Casamero was formally recognized as part of the larger Chaco World, a site monitoring and protection plan was initiated and the land was fenced by the Bureau of Land Management (Gaudy 1981; Lester 1978, 1981; Lester and Neller 1978; Roney 1982) and a cultural resources plan for the management of the community was prepared (USDI-BLM 1984). The Bureau of Land Management also recognized the need for intensive survey of all land set aside as Chaco protection sites; thus, a contract with the Office of Contract Archeology of the University of New Mexico was initiated. The resulting report by Harper et al. (1988) (Chapters 2, 3, and 6 through 9 herein which have been condensed) evaluated, and contrasted evidence from survey of the parcel of land on which Casamero and many of its surrounding small sites with that of the Pierre's Site parcel to distinguish differences in types of community structure, dates of establishment and decline, interaction with other communities in the San Juan Basin, and types of material that may have been traded among various communities.

This Volume

Although not all research carried out in the Casamero community is presented in detail in this volume, the chapters included were selected for several reasons. First, publication of data with limited distribution is a major goal of the Archaeological Society of New Mexico and the Bureau of Land Management in their respective publication series. The excavation (Sigeo 1966, 1967, 1981) and stabilization (Lester and Neller 1978; Neller 1978) reports for Casamero Pueblo exist as file copies at the Bureau of Land Management offices, the Chaco Culture NHP Museum Collection, and the Maxwell Museum of Anthropology; they are available to scholars on request. This does not, however, make the data easily available for researchers to use or evaluate.

Second, the Casamero community is one of the few for which archaeologists have sufficient survey and excavation data to better understand the period between A.D. 900 and 1150. As Neller (Chapter 5) points out, these data provide an opportunity to examine a community that existed for the most part during the florescence of Ancestral Pueblo culture in Chaco Canyon, was clearly related to it, and declines in unison with it. There are few site components that do not fit within this time frame, and the data suggest that most of the sites were established, lived in for a

somewhat limited period of time, and are not overlain by later cultural materials. Questions about contemporary communities outside Chaco Canyon, therefore, can be examined by using this database to study a southern San Juan Basin affiliated community, as Winter (Chapter 9) does so well when he contrasts evidence from the Casamero and Pierre's site survey parcels.

Third, more recent investigations from the subregional and regional perspective have been underway for several years. John Kantner (1996a, 1999; Kantner et al. 2000) and Ruth Van Dyke (1997a, 1999a, 2000) are currently examining other Chaco related sites in the eastern Red Mesa Valley. They are among scholars who are contributing to a Chaco community database maintained by Kantner (http//:sipapu.gsu.edu/ Chacoworld.html) that will allow us to answer questions such as whether the similarities between great houses in Chaco Canyon and throughout the larger region are the result of migration or imitation, whether the areas are related through an ideological system or elite political power base, among others. By comparing data from Casamero with other areas under study in the Red Mesa Valley, Kantner and Van Dyke are beginning to answer some of the questions raised by Sigleo and Neller.

Kantner's concluding remarks (Chapter 10) illustrate why it is important to bring forth the unpublished reports to a wider audience. He places the Casamero data in a more recent and broader framework, both for the Red Mesa Valley and the Chaco World. He elaborates on the role of Casamero between A.D. 900 and 1150 and indicates how the data from this community are being used to evaluate hypotheses that have been proposed during the past few decades. Thus, a volume devoted to the Casamero community illustrates how it can be used by other scholars once these data are available.

In preparing this volume, I have tried to use terminology that is consistent with today's practices. Thus, the term "Anasazi" has been replaced by "Ancestral Pueblo." Some authors refer to a "region" when they discuss the Chaco World; others discuss this larger region as a "system" or "phenomenon." The great house at Casamero is referred to in the text as "Casamero Pueblo" even though some of the illustrations carry the term "Casamero Ruin." Because the original illustrations for Chapters 2 and 3, as well as 5 through 9 were not available, there are a few discrepancies in terminology between text and figures, and the quality of the figures is not as good as one might like. For this reason and because we have condensed some chapters from Harper et al. (1988), the reader is provided with the location of the original source of each previously published or unpublished chapter as a footnote on its first page.

In summary, this compilation of material on Casamero reflects the period during which the various contributions were made. Although new research will continue to add to our knowledge of this interesting community in the southern half of the San Juan Basin, it is hoped that scholars and interested readers will more easily access this information and use it to understand the role of the Casamero community within the larger Chaco World.

Photograph courtesy of Tom Obenauf.

CHAPTER 2

ENVIRONMENTAL SETTING[1]

Marilyn K. Swift

Geology and Physiography

The San Juan Basin is an asymmetric physiographic feature located within the Navajo and Datil sections of the Colorado Plateau Province (Loose 1978:17). Formation of the San Juan Basin occurred between the Precambrian Era and the Cretaceous Period in conjunction with the formation and regression of the epi-continental sequences of the Laramide uplifted formations which enclosed the basin. The southern boundary of the basin is formed by the Zuni Uplift and the Chaco Slope. Casamero Pueblo (Figure 2.1) and survey parcel are situated within the Zuni Uplift, which has exposed formations of the Jurassic Period evident within the uplift.

The protected Casamero parcel that is managed by the Bureau of Land Management includes part of the Casamero community. It is an L-shaped parcel which encompasses the northeast portion of Tecolote Mesa; a lower, east/southeast facing talus slope; and an area to the southeast of the mesa, which forms a portion of the alluvial valley above and to the west of Casamero Draw. This valley is within the eastern portion of a broader valley known as the Red Mesa Valley. Elevation ranges between 2,068.2 m (6,840 ft.) in the lower valley to 2,196.0 m (7,200 ft.) on top of the mesa. The slope is steep, ca. 50 percent, between the mesa top and lower talus slope, and slight to moderate, ca. 2 to 5 percent, across the valley. Entrada sandstone forms the upper portions of Tecolote Mesa and is capped by the Todilto limestone.

Soil Associations

The following information concerning the study area soils is derived from Buchanan (1978). The soil associations found within the Casamero parcel are Moriarty-Prewitt and the Rock Land-Travesilla.

The Moriarty-Prewitt association occurs in valley bottoms, floodplains, and terraces along intermittent drainages. This association is dominated by soils that are moderately saline or are affected by alkaline accumulations. Soils form in fine-textured alluvium and are particularly susceptible to gully erosion. Broken soils characterize the Rock Land-Travesilla association. This occurs on relatively narrow valley floors or upland summits, which often are separated by steep canyon walls. Sandstone bedrock and shale are common within this association, as are thin deposits of gravelly alluvium found on breaks adjacent to the steep canyon walls and escarpments.

Habitat Type

Numerous studies have been conducted with respect to the species of plants and animals associated within local vegetative communities and physiographic settings. Plant species listed in Table 2.1 are derived from extensive lists compiled during both the Bisti-Star Lake Inventory (Noisat 1978) and the Western Area Survey (Whitford 1978). Lists of fauna common to pinyon-juniper, desert shrub, sage-parkland,

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[1]This chapter originally appeared as parts of Chapters 2 and 3 in Harper et al. (1988).

Figure 2.1. View of Casamero Pueblo (foreground) with Tecolote Mesa in background. (From Harper et al. 1988:Figure 2.1.)

rock outcrops, and within Chaco Canyon (Table 2.2) were compiled from information gathered during an inventory conducted in the vicinity of Black Lake (Swift 1983) and from studies conducted within Chaco Canyon proper (Cully 1985). The floral and faunal data were selected from study areas in proximity to the Casamero survey parcel. These previous studies provide species data from a variety of microenvironments similar to those found within the Casamero parcel, which is situated in a transition zone between pinyon-juniper woodland and desert shrub communities. At the Casamero parcel, vegetation associated with a pinyon-juniper woodland community dominates the mesa top, edges, and lower talus slopes. Along the lower talus slope, the pinyon-juniper cover changes to a heavily grazed desert shrub community as the topography opens into an alluvial valley. Snakeweed dominates the vegetation and attests to an overgrazed condition. Salt tolerant species increase in frequency with proximity to Casamero Draw.

Table 2.1. Common Plant Species By Floral Zone (from Noisat 1978 and Whitford 1978).

Pinyon Juniper

Pinyon (*Pinus edulis*)
Juniper (*Juniperus monosperma*)

Common Shrubs:
- Sage (*Artemisia tridentata*)
- Mountain mahogany (*Cercocarpus montanus*)
- Cliffrose (*Cowania mexicana*)
- Squawbush (*Rhus tribolata*)
- Broad leaf yucca (*Yucca angustissima*)
- Gamble oak (*Quercus* sp.)
- Big rabbitbrush (*Chrysothamnus nauseosus*)

Grasses and Forbes:
- Bluebunch wheatgrass (*Agropyron spicatum*)
- Astragalus (*Astragalus* sp.)
- Grama grass (*Bouteloua* sp.)
- Bird beak (*Corylanthus wrightii*)
- Tansey mustad (*Descurainia pinnata*)
- Buckwheat (*Eriogonum* sp.)
- Galleta grass (*Hilaria jamesii* sp.)
- Mulhy grass (*Muhlenbergia* sp,)
- Indian Rice grass (*Oryzopsis hymenoides*)
- *Polygonium* sp.

Sage Parklands

Common Shrubs:
- Sagebrush (*Artemisia tridentata*)
- Sand sage (*Artemisia filifolia*)
- Four-wing saltbush (*Atriplex canescens*)
- Big rabbitbrush (*Chyrsothamnus nauseousus*)
- Mormon tea (*Ephedra* sp.)
- Snakeweed (*Gutierrezia sarcothrae*)
- Four o'clock (*Mirabilia multiflora*)
- Prickly pear (*Opuntia* sp.)
- Dock (*Rumex* sp.)
- Greasewood (*Sarcobatus vermiculatus*)
- Yucca (*Yucca* sp.)

Grasses and Forbes:
- Amaranth (*Amaranthus* sp.)
- Three awn (*Aristada fendleriana*)
- Grama grass (*Bouteloua* sp.)
- Spurge (*Euphorbia fendleri*)
- Galleta grass (*Hilaria jamesii*)
- Sandhill muhly (*Muhlenbergia pungens*)
- Tumbling mustard (*Sisybrium altissimum*)
- Alkali sacaton (*Sporobolus airoides*)
- Sand dropseed (*Sporobolus cryptandrus*)

Table 2.1. Continued

Shrub-Grassland Zone

Shrubs:
- Greasewood (*Sarcobatus vermiculatus*)
- Shadscale (*Atriplex confertifolia*)
- Rabbitbrush (*Chrysothamnus nauseosus*)
- Four-wing saltbush (*Atriplex confertifolia*)
- Snakeweed (*Gutierrezia sarothrae*)
- Wolfberry (*Lycium pallidum*)

Grasses:
- Indian rice grass (*Oryzopsis hymenoides*)
- Galleta grass (*Hilaria jamesii*)
- Sand dropseed (*Sporobolus* sp.)
- Three awn (*Aristada* sp.)
- Ring grass (*Muhlenbergia torreyi*)
- Brome (*Bromus* sp.)
- Rye grass (*Emylus* sp.)
- Skeleton grass (*Erigonum* sp.)
- Dock (*Remex* sp.)
- Astragalus (*Astragalus* sp.)
- Muhly grass (*Muhlenbergia* sp.)
- Bluebunch wheatgrass (*Agropyron* sp.)

Atriplex Zone

Shrubs:
- Shadscale (*Atriplex confertifolia*)
- Four-wing saltbush (*Atriplex canescens*)
- Greasewood (*Sarcobatus vermiculatus*)
- Snakewood (*Gutierrezia sarothrae*)
- Wolfberry (*Lycium pallidum*)
- Russian thistle (*Salsola kali*)
- Indian paintbrush (*Castilleja miniata*)
- Scarlet gilia (*Gilia aggregata*)
- Beardstongue (*Penstemon* sp.)
- Yucca (*Yucca* sp.)

Climate

The Casamero parcel is situated within an arid region of the San Juan Basin. Climatological factors that contribute to this condition include temperature, precipitation, solar insolation, and evapotranspiration rates. Temperature rates within the San Juan Basin are affected by variations in elevation and topography. According to Ferrill (1978:105), the dissected shallow basin of the Colorado Plateau may average a vertical temperature gradient of 3 to 5 degrees for every 1,000 ft. in elevation. The Casamero parcel is at the southern boundary of the San Juan Basin and the Colorado Plateau. In general, protracted periods of summer daytime temperatures may exceed 90 degrees Fahrenheit while nighttime temperatures may drop to 40 degrees. The number of annual frost-free days averages 140 to 160.

Table 2.2. Faunal species by habitat (from Swift 1983 and Cully 1985).

	Habitat					
Latin (common) Name	1	2	3	4	5	6
Amospermophilus leucurus (White-tailed antelope squirrel)	x	x		x	x	x
Antrozous palliodus (Pallid bat)			x			
Canis latrans (Coyote)						
Cynomys gunnisoni (Gunnison's prairie dog)		x				x
Dipodomys ordi (Ord's kangaroo rat)	x	x		x		x
Dipodomys spectabilis (Banner-tailed kangaroo rat)	x					x
Erethizon dorsatum (Porcupine)						x
Eutamias quadrivittatus (Colorado chipmunk)					x	x
Felix concolor (Mountain lion)						x
Lasionycteris noctivagans (Silver haired bat)					x	
Lepus californicus (Blacktailed jackrabbit)	x	x		x	x	x
Lynx rufus (Bobcat)						x
Neotoma albigula (Woodrat)					x	
Neotoma cinerea (Bushy-tailed woodrat)					x	x
Neotoma stephensi (Stephen's woodrat)						x
Odocoileus hemionus (Mule deer)				x	x	x
Onychomys leucogaster (Northern grasshopper mouse)	x	x				x
Perognathus flavus (Silky pocket mouse)	x	x		x	x	x
Perognathus flavescens (Plains pocket mouse)						x
Peromyscus crinitus (Canyon mouse)					x	x
Peromyscus maniculatus (Deer mouse)				x	x	x
Peromyscus trueii (Pinyon mouse)					x	x
Pipistrellus hesperus (Western Pipestrelle bat)			x			
Plecotus townsendi (Townsend's Big-eared bat)			x			
Reithrodontomys megalotis (Western harvest mouse)		x			x	
Spermophilus spilosoma (Spotted ground squirrel)	x	x				
Spermophilus variegatus (Rock squirrel)						x
Syvilagus audoboni (Desert cottontail)				x	x	x
Taxidea taxus (Badger)						x
Thomomys bottae (Botta's pocket gopher)						x
Urocyon cineroargenteus (Grey fox)						x
Vulpes macrotis (Kit fox)	x	x				x
Vulpes vulpes (Grey fox)					x	

Key to habitats:

1 Shrub-grassland uplands near Black Lake.
2 Rock outcrop 10 miles northwest of Chaco Culture National Historical Park.
3 Not indicated, night sighting of bats.
4 Sage parklands.
5 Pinyon-juniper woodland on Chacra Mesa.
6 Chaco Culture National Historical Park.

Average annual precipitation varies between 10 to 14 in. in this southern area (Ferrill 1978). The greatest precipitation occurs within lower elevations during summer rain storms, while winter snow storms provide the greatest precipitation for higher altitudes. During the summer, orographic, convergent, and convective storms result when hot and moist ground level air is drawn upward to higher altitudes. Expansion and cooling result in condensation and precipitation as moist oceanic air is pulled from the Pacific Ocean, the Gulf of California, or the Gulf of Mexico by differential continental heating (Allan 1977). Convective storms, which produce summer thunderstorms, generally cover no greater than 5 to 10 mi. in area (Ferrill 1978:96). This small areal coverage contributes to the unpredictability of the San Juan Basin environs.

In winter, precipitation results from the differential rate of cooling between oceanic and continental land masses. This differential contributes to the formation of high pressure zones, which, as they move to the southeast, draw moist polar Pacific air inland. The moist air cools and condenses as it rises in elevation and, combined with colder temperatures, produces winter snow storms.

High solar insolation rates occur between April and the end of August (Ferrill 1978). High altitude, few clouds, low humidity, and sparse vegetation contribute to these rates. High solar insolation rates combined with high temperatures and low humidity contribute to high evapotranspiration rates. These rates are caused by losses from hydrolic, soil, and plant transpiration, which together contribute to an average annual moisture deficit of 14 to 18 in. (Ferrill 1978). The moisture deficit is above the average annual precipitation rate for the northern area and just above that for the southern area. These observations help to demonstrate the marginal nature of the general area for agricultural purposes.

Hydrology

Casamero Draw, which lies due east of the Casamero parcel, is an upper tributary of the Rio San Jose. In turn, the Rio San Jose forms an eastern watershed of the Rio Puerco. Both streams are intermittent and are known for their flash-flooding potential (Dingman 1978). During periods of rapid runoff, peak flows have been recorded for the Rio San Jose up to 590 times the average flow. The Rio San Jose and Rio Puerco watersheds are part of the middle Rio Grande system.

Numerous stock ponds and reservoirs near the Casamero parcel serve to capture runoff and provide watering sources for livestock. With respect to prehistoric sources which could have served the occupants at the Casamero community, it is probable that areal seeps, springs, intermittent streams, and runoff from slickrock exposures and mesa tops provided the necessary water for potable or agricultural purposes.

Available Resources and Raw Materials

The question of resource availability within the San Juan Basin is relevant to the needs of the human systems that use the basin. Currently, resources are extracted to meet energy demands related to the oil and gas and uranium-mining industries. Secondary use is realized through grazing permits which satisfy the concerns of ranching and herding operations. A much different set of parameters applied to prehistoric occupations. A possible list of necessary resources would include lithic material sources, clay sources for ceramic vessels, wood for hearth fuel, wood and building stone for house construction, and agriculturally suitable land, as well as the previously mentioned plant and animal resources for food, clothing, and related needs.

Lithic material sources are abundant in the San Juan Basin and the names of the materials

often reflect the specific source area (Narbona Pass chert [formerly known as Washington Pass chert], Chinle chert, Cerro Pedernal chert, Grants obsidian, Jemez obsidian). Cobble- and pebble-sized stones of various materials have been identified in the lag gravels of the San Juan Basin (Marshall et al. 1979). Studies of potential clay sources in the vicinity of Chaco Canyon indicate that a range of usable clays is available locally (Windes 1977). The best clays are found in the Fruitland and Menefee formations and the Kirtland and Lewis shales. These formations are found in circular distribution around the central basin periphery (Fassett and Hinds 1971; Loose 1978). Additionally, clays weathered and eroded from the above listed formations are ubiquitously distributed in the basin wash bottoms.

Analysis of materials from prehistoric hearths in Chaco Canyon suggests that greasewood and fourwing saltbush were the major components used for hearth fuel while sagebrush, pinyon, and juniper comprised lesser percentages. Wood necessary for construction included, but was not limited to, pinyon, juniper, Douglas fir, and ponderosa pine. Although it is unknown to what extent the prehistoric use of construction wood has altered the present distribution, moist conditions around canyon heads at elevations of 2,100 m (6,888 ft.) or greater encourage the present growth of ponderosa pine and Douglas fir stands (Powers et al. 1983). Based on the stabilization and Anasazi Community studies (Bureau of Land Management 1978; Marshall et al. 1979), building stone for the Casamero Pueblo derives from local outcrops of Todilto limestone and Entrada sandstone.

Other studies assessed the relationship of Chacoan structures and communities to arable land (Cully et al. 1982; Powers et al. 1983). These studies suggest that, in combination with runoff from mesa top or badland exposures, water control systems, which spread water across the valley slopes and bottomlands associated with the Casamero Pueblo, could have provided the necessary conditions for agriculture.

Current Land Use

Current land use patterns reflect contemporary and historic economic pursuits. At the Casamero parcel, the following historic disturbances or land alterations are present. In the northwest corner, surface stripping of a large area of the mesa top suggests uranium mining. Two-track vehicle trails are evident throughout the lower parcel. Section fences were constructed near the southern and eastern boundaries. In the bottomlands, ditches are evident. These are presumed to result from either the construction of irrigation or erosion control channels. Pothunting has occurred within the archaeological sites. Nickens et al. (1980) report that vandalism associated with the pothunting of archaeological sites increases when economic conditions worsen.

Grazing is apparent. Ethnographic research for Navajo activities at the Casamero Pueblo and surrounding area has not been conducted, although one of the recorded sites appears to be a Navajo corral.

Methodological Considerations

Methodological considerations take into account the numerous factors which affect the archaeological record as it is viewed and recorded by surface-visible manifestations. Contemporary studies recognize that site formation is a part of the process of use and abandonment of places. Specified places are used with respect to their ability to provide the necessary amenities of food, water, shelter, and other potential resources. In hunting and gathering systems, because places may potentially yield more than one resource, certain locations may be revisited at different times

within an annual round, but for different purposes. In agricultural systems these same parameters exist, but other places are continuously used as permanent habitation loci. The archaeological record at these loci derives from the creation, use, discard, loss and/or abandonment of artifacts, features, or structures associated with single, multiple, or continuous episodes of use.

In addition to overlapping use episodes which cover, move, alter, and obscure the discard (archaeological) record of earlier occupations, taphonomic problems introduced by postdepositional factors further affect the record. At a minimum these include an array of factors caused by weather conditions including rain, snow, and windstorms, which result in the formation and alteration of the landscape. Processes of pedogenesis, deflation, and accumulation of soils add to landscape formation and contribute to the differential exposure or burial of archaeological materials. Within the Casamero parcel, it is expected that soils accumulated from the valley bottoms are derived from deflated and eroded contexts from slope areas. Wells' (1983) study of badland formation along the Ah-shi-sle-pah drainage demonstrates this point.

In Well's study, badland formation is dated to the mid to late Holocene at 5000 to 3000 B.P., concurrent with the onset of a more arid environment. With a more arid environment and concomitant change in vegetation, and with increased eolian activity, Quaternary surfaces are more susceptible to removal. When combined with intermittent episodes of increased effective moisture during summer-dominant storm patterns, the parameters are set for induced runoff, accelerated erosion, and regional badland development. The effects of extensive erosion of both Quaternary deposits and Cretaceous-bedrock would result in large quantities of sediment introduced into the fluvial system. Another eolian event is estimated to have occurred at 1500 B.P. Again, the effect would be increased sedimentation and wide-spread valley aggradation. Thus a period of aggradation was introduced in the mid Holocene and increased in areal extent in the late Holocene.

These findings have important consequences for archaeological discovery. Given the fact that eolian conditions would increase erosion of Quaternary deposits, the following scenario results. Archaeological materials within eolian deposits on dunal ridges are the most subject to rapid sequences of sediment accumulation and/or deflation that would occur under arid conditions. With the deflation of eolian deposits to underlying clay-rich or badland deposits, conditions of increased moisture would accelerate erosion. Runoff on steep slopes would be rapid and down-slope sedimentation would increase. While this may place the upslope archaeological deposit in jeopardy, the process would serve to cover and, to some extent, leave intact the archaeological materials deposited on the valley bottom.

Given Wells' calculations, these processes began around 1050 B.C. and were reinforced by a later event in A.D. 450. Arid conditions continue presently and are evident today by the numerous badland environments in the San Juan Basin. The consequences for site discovery are discussed in the Expected Resources section of Chapter 3.

CHAPTER 3

CULTURAL OVERVIEW[1]

Marilyn K. Swift

Numerous investigations have taken place within the San Juan Basin. These have been conducted in relation to oil and gas, coal, and uranium development; irrigation projects; and research projects funded by the National Park Service. The results of these studies have documented a semi-continuous range of human occupation from the Paleo-Indian through the modern periods. The following overview of the cultural chronology is based on these findings. Reviews of previous work conducted in specific relationship to the Casamero parcel appear in Chapter 6. In combination with this cultural overview, these data suggest a pattern for the temporal range and type of resources which could be expected from a survey of the Casamero parcel.

Cultural Chronology

Paleo-Indian Period

Use of the San Juan Basin by Paleo-Indian hunters and gatherers is reflected by the occurrence of isolated finds of projectile points associated with the Clovis or Llano Complex (12,000 to 10,500 B.P.), the Folsom Complex (11,000 to 10,000 B.P.), the Plano Complex (10,000 to 9000 B.P.), and the Cody Complex (9500 to 7500 B.P.) (Gilpin et al. 1984; Hadlock 1962; Hogan 1986). While the absence of stratified deposits limits the precise identification of the specific adaptations, the general consensus is that the Paleo-Indian adaptation focused on the hunting of megafauna such as sloth, camel, and mammoth during the earlier periods and bison in the later ones. Shifts in climatic conditions and attendant vegetative regimes are listed as causative factors in the extinction of megafauna, which resulted in the shift in hunting technology.

Further environmental changes are attributed to the movement of bison out of the northwestern New Mexico area, thereby precipitating the close of the Paleo-Indian Period. Divergent theories postulate that Paleo-Indian populations moved out of the area following the bison herds; others argue that early Archaic Period assemblages reflect technological adjustments to the changing resource base (Hogan 1986:7). No temporally-diagnostic artifacts from the Paleo-Indian Period were recovered during the present investigations.

Archaic Period

More intensive use of the San Juan Basin environs has been documented for the Archaic Period (Acklen and Greiser 1977; Del Bene and Brancard 1985; Gilpin et al. 1984; Hayes 1981; Hogan and Winter 1983; Huse et al. 1978; Reher 1977; Scheick 1979; Simmons 1982; Vogler et al. 1982). Commonly, documentation of Archaic artifacts, features, or sites rests on typological comparison to the sequence developed for the Oshara tradition (Irwin-Williams 1973). Based on studies conducted in the Arroyo Cuervo Valley, this typology defines five phases: the Jay Phase (7500 to 6800 B.P.), the Bajada Phase (6800 to 5200 B.P.), the San Jose Phase (5000 to 3800 B.P.), the Armijo Phase (3800 to 2800 B.P.), and the En Medio/Basketmaker II Phase (2800 to 1550 B.P.).

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[1] This chapter initially appeared as part of Chapter 3 in Harper et al. (1988).

In brief, these phases encompass the following environmental, archaeological, and economic parameters (Irwin-Williams 1973:4-14). Technological attributes, particularly with regard to projectile points, distinguish the tool kits of the Jay and Bajada Phases. Increased population is noted towards the end of the Bajada Phase. In the following San Jose Phase, increased moisture contributed to the stabilization of dunes and the greater reliability of springs. These conditions in turn may have led to the occurrence and consequent use of a wider resource base which is attended by further changes in the toolkit. Cobble-filled surface or subsurface ovens occur at this time. An increase and wider range of tools, including groundstone, is noted during the Armijo Phase. Sites categorized as base camps encompass features with irregular posthole patterns which suggest temporary structures, large fire-cracked rock and cobble heaps, and some evidence of work areas. The initiation of a seasonal pattern of aggregation in relation to the onset of limited agriculture is suggested by the presence of maize pollen found at En Medio Shelter. This pattern persists through the En Medio Phase as is evident by an increase in groundstone artifacts. Hearths contain *Chenopodium* sp. seeds, grass seeds, and cactus fruit; together these emphasize the collection and processing of seasonally-specific resources. The earliest Ancestral Pueblo materials are found within the En Medio Phase.

Although many researchers accepted this scenario, more recent investigators question the direct application of this model to the Archaic component of the archaeological record in the San Juan Basin. Hogan and Winter (1983), for example, state four problems: 1) the typology lacks definitive standards; 2) variability produced through differences in raw material, skill, or worker intent–or reuse of broken points–is unaccounted for, 3) projectile points are absent at small sites; and 4) projectile points may be ambiguously associated with ^{14}C dates. For some sites, a small sample of points may not establish a range in morphological variation while at larger sites with many points, direct association of points with carbon dates is ambiguous.

Researchers also question both the timing of the introduction of agriculture and the effects of agriculture on hunting and gathering adaptations (Berry 1982; Hogan 1985; Hogan and Winter 1983; Irwin-Williams 1973; Simmons 1981). Berry and Irwin-Williams disagree on both the timing of the introduction of agriculture and the effect on the evolution of human adaptations. Irwin-Williams argues that maize was introduced as early as 3950 B.P. and constituted only a minor component of the economic subsistence. Simmons presents evidence for maize at two sites dated between 3600 to 4000 B.P. and suggests that maize was a supplemental resource by late San Jose times. Berry denies the dating of maize prior to 1650 B.P. and argues that the introduction of agriculture marks a period of rapid change. Hogan and Winter contend that hunters and gatherers persisted in the San Juan Basin contemporaneously with agriculturally based economies.

Temporally diagnostic Archaic projectile points were recovered during the course of the present project. The typology and context of these finds will be discussed later in this report.

Ancestral Period

A major Ancestral Pueblo occupation developed from the incipient agricultural adaptations discussed in the preceding section (see Hogan 1985), and lasted from the Basketmaker III through the Pueblo III periods. Within this time frame, a complex system of human organization evolved, which is manifest in the large Chaco structures and formal road network and is postulated to have regulated imbalances in agricultural productivity caused by a marginal environment.

Researchers focused on understanding the Chaco phenomenon have noted temporally sensitive variations within Chacoan architectural design and Chacoan ceramic assemblages. The large amount of data collected from Chacoan sites has allowed the general temporal phases, as initially defined under the Pecos classification system, to be refined for the Chaco area. The refined chronology is summarized in Figure 3.1 (cf. Powers et al. 1983:Figure 3). Specifically, the phases used in this project follow Toll et al. (1980), with some modification.

The following discussion will focus on the chronologic development of Chacoan communities. Ceramic styles associated with the chronologic sequences are presented in Chapter 7.

Basketmaker III - Pueblo I

The Basketmaker III Phase is characterized by the presence of Lino Gray ceramics, subterranean pithouses, and occasional great kivas. This period generally marks the beginning of an agriculturally-based subsistence strategy. Many Basketmaker III sites have been documented both on the mesas above Chaco Canyon and in varied topographical locations to the south of Chaco Canyon (Vivian 1970, 1990). Storage rooms and ramada areas are commonly found behind pithouses of the Pueblo I Period. While construction of many of the Chacoan outliers did not begin until the Pueblo II Period, early Pueblo I (A.D. 800) construction is noted at several of the great houses in Chaco Canyon (Judge et al. 1981:Figure 3). Small Pueblo I communities are found at many of the outlier locations (Powers et al. 1983). These data may suggest that the beginnings of the Chaco system dated to the Pueblo I Period. Architectural and ceramic studies by other researchers corroborate an early inception of the Chaco exchange network (Marshall et al. 1979; Whalley 1980).

Pueblo II

The Pueblo II Period marks the beginnings of the Hosta Butte and Bonito construction "phases," which have been defined to differentiate contemporaneous architectural styles. Enclosed kivas within simple masonry roomblocks define the Hosta Butte Phase whereas multistoried masonry construction, planned layout, large kivas, and large rooms characterize the Bonito Phase (Judge et al. 1981). Bonito Phase rooms average 16 to 18 m^2. Hosta Butte or small house rooms are smaller averaging 7 to 9 m^2. Marshall et al. (1979) attribute this difference in size range to functional reasons and suggest that the larger rooms served as redistribution centers, in contrast to the smaller, residential rooms. While much of the research concerning Chacoan structures focused on the constellation of Chacoan structures inside Chaco Canyon, similar structures designated as Chaco outliers, are noted outside of the canyon as well.

Chaco outliers are defined by the following criteria (Powers et al. 1983): 1) Chaco or Bonito Phase construction, 2) Chacoan ceramics, 3) great kivas or tower kivas, 4) association with the Chaco road system, and 5) visual signaling or communication system.

Pueblo III

Construction of the majority of the Chacoan structures dates to the Classic Bonito Phase. As evidenced by the Great North Road, trading influences shifted to the north. In fact, construction of many of the northern outliers, such as Salmon, Aztec, and Chimney Rock, dates to this period.

An influx of Chaco-McElmo ceramics, which include elements of Mesa Verde style, appears during the early part of this period. Construction

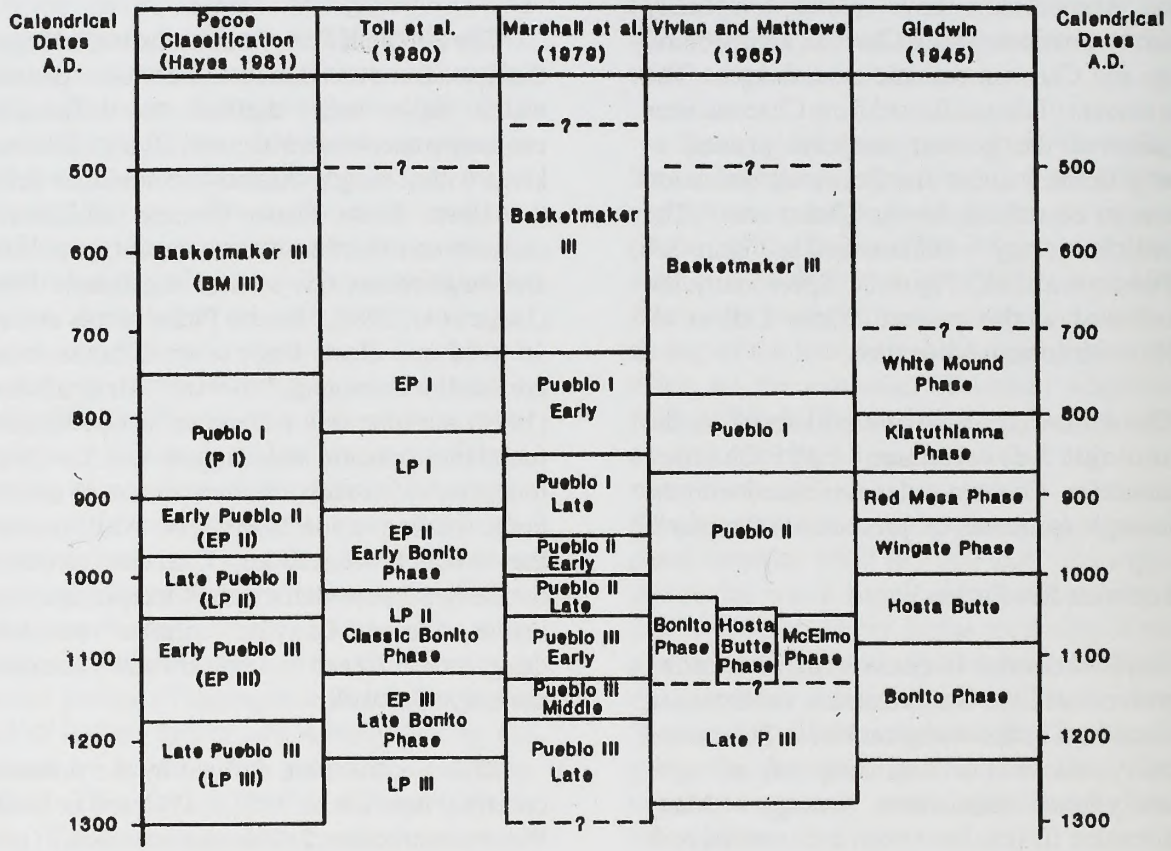

Figure 3.1. Temporal classificaton for Chacoan chronology adapted from Powers et al. (1983:Figure 3.) (From Harper et al. 1988:Figure 3.1.)

at pre-existing Chaco Canyon structures continued throughout this period. Powers et al. (1983:253) suggest Early Pueblo III as the earliest period to which construction and use of prehistoric roads can be dated. The unilateral assignment of Early Pueblo III as the construction date for all of the road segments is problematic, however, because most of the roads have not been dated. It is probable that other road segments were also constructed simultaneously with the construction of the great houses associated with the roads; if so, many of these road segments would predate construction of the North Road.

Collapse of the Chaco system is believed to have occurred by A.D. 1175 (Hogan 1986). The most accepted reason for this collapse is that of environmental deterioration precipitated by the A.D. 1130 to 1180 drought. Vivian and Mathews (1965:20) suggest that small groups remained behind and constructed defensive type sites, one within the canyon and several to the south of the canyon. Ford et al. (1972) suggest that the major migration of the Chaco occupation followed a route east along the Rio Puerco. Other migrants may have moved to the Chuska, Zuni, and Tesuque areas.

Theoretical Considerations

Early theoretical models focus on Chaco Canyon and seek both to explain the cultural change which led to the building of the massive Chacoan structures and to determine the functional relationship of these buildings to the small domiciles which were occupied at the same time. Subsequent surveys in areas peripheral to the canyon document the existence of other Chaco-like structures and communities throughout the San Juan Basin and nearby areas. A road network which connected the communities was also identified. Terms such as the Chaco regional interaction sphere were adopted to describe this archaeological phenomenon. Other terms such as Chacoan outliers were adopted to describe the Chacoan structures and communities outside of Chaco Canyon. This term reflects an ongoing bias on the part of most researchers who believe that Chaco Canyon was the center or hub of a basin-wide redistribution network. This network is believed to have developed to balance the subsistence stress created by marginal environmental conditions in the Basin. More recently, research focuses on the nature of the Chacoan network and calls into question the nature of that system. The following discussion will provide a brief background of the theories which explain the development of the Chaco system.

1) Environmental Constraints. In all of the following models, environmental conditions—whether they are couched in terms of climatic, agricultural, or geomorphological processes—are attributed either as the impetus for, or as factors instrumental in, the development of a complex social structure associated with the Chacoan system. The Chaco area is categorized as a stressed and unstable environment of low predictability with highly variable precipitation that occurs in infrequent and discrete amounts (Schelberg 1979:7). Comparison of Dean and Robinson's tree-ring data demonstrates that, across the San Juan Basin, high variability also characterized the past (Swift 1983:Figure 3). Tree-ring data suggest that local population and settlement patterns fluctuated according to summer- or winter-dominant rainfall (Euler et al. 1979; Judge et al. 1981; Powers et al. 1983; Schoenwetter and Eddy 1964).

2) Social Organization and Patterns of Exchange. Early recognition of the coexistence of large towns (Bonito Phase) and small villages (Hosta Butte Phase) led Vivian (1970) to propose that two different systems of social organization were operant. Village sites were the residence units of corporate lineages and towns served as the dual residences occupied by non-exogamous moieties with a unilocal residence pattern. Based on modern pueblo analogs, Vivian suggests that social cohesion was achieved by sharing governmental and ceremonial responsibilities between moieties whose membership was selected from community associations.

Grebinger (1973) proposes a model of social organization dominated by a pristine ranked society. Emergence of the higher status individuals resulted from preferential access to highly productive agricultural land. Low status groups included individuals without access to productive land. These individuals were incorporated into the hierarchical society as part of a labor force as specialists in masonry construction, craft production, or water control. Resources were exchanged and status maintained during redistribution ceremonies conducted in great kivas.

Based on recognition of the greater diversity of the Chaco system, Judge (1979, 1989) developed a model of regional exchange that places Chaco Canyon at the center of a regional exchange system. While reciprocal trade probably occurred early (in Basketmaker III-Pueblo I times) between kinsman in different areas of the San Juan Basin, by the early tenth century incipient redistribution moved goods between resource areas rather than between kin. Greater formalization of the redistribution network

occurred during the eleventh century as goods were brought into Chaco Canyon along the Chaco roads and stored in the Chacoan structures. Administrative specialists served to redistribute foodstuffs and plan resource (craft) production and distribution. At this time, resource redistribution may have shifted in emphasis to a sodality-based system. Judge believes this system was necessary to maintain redistribution as the environment reached niche saturation and agricultural productivity was diminished.

In contrast, Marshall et al. (1979) define Chacoan society as socially complex but non-stratified. Their explanation is couched in functional terms. The small houses functioned as domiciles, while communal effort was needed to construct the Bonito Phase structures. Based on room size and the absence of copious trash mounds associated with the great houses, Marshall et al. postulate that they served as storage rooms and public meeting places necessitated by the enactment of public obligations and community projects. Thus, they term these structures "public buildings."

Tainter and Gillio (1980) address the outlier communities in a hierarchical system of exchange. They also place Chaco Canyon as the central node and the other outliers as first and second, and the villages as third order centers. Regulation of exchange in a hierarchical arrangement was necessary to maintain Chaco as the primary node. Tainter further argues that outliers were the residences of local elites who imitated the "sumptuary behavior" of the Chaco elite (Hogan 1986; Tainter and Gillio 1980).

Winter (1980) presents a model of exchange which incorporates the principles of biogeography, specifically as it relates to marginal environments. Winter argues that the Chacoan system operated in a marginal environment that required the expenditure of energy from outside sources, and he suggests that exchange network systems may have provided the necessary input: extended, bounded, solar central place, and dendritic central place. These systems evolved in a hierarchical arrangement and regulate exchange of information, food, labor and services across a variety of environments. Winter (1980:512) interprets the development of any political or social organization as, at least in part, a response to environmental conditions. Thus the collapse of the Chacoan system is seen as a response to the cumulative effects of resource depletion and consequent biotic collapse.

Schelberg (1984) models a three- or four-level hierarchical adaptation. In summation of the causes for the development of this hierarchical arrangement, he states it may have been the result of:

> . . . an attempt to adapt more efficiently to stressed semiarid environments of low productivity and low predictability because of the necessity to monitor a wide range of variables and to coordinate the activities and responses of many people. (Schelberg 1984:18)

3) Recent Research. More recent studies have called into question the proposed redistribution nature of the Chacoan system (Hogan 1986; Judge 1983; Sebastian 1983, 1986; Toll 1984). In brief, a system of exchange alliances is believed to have arisen in different areas of the basin. While it appears that Chaco Canyon was a geographic center between A.D. 1075 and 1125, rather than functioning as a redistribution node in a basin-wide exchange system, it instead functioned as a center of import and consumption. By A.D. 1125, the southern outliers had been abandoned, and between A.D. 1125 and 1140, Salmon and Aztec became the centers of a northern exchange system. Debate continues, however, as to whether Chaco Canyon then became a second-order center or whether it maintained its status as a center in a regional system, until its abandonment.

Navajo History and Economic Background

Researchers have divided Navajo history into a number of subdivisions to reflect the history of local areas. The following is a synthesis of pertinent research which applies to the San Juan Basin.

Dinetah Phase

The Navajo are a migrant Athabaskan group. Both their route and time of entry into the Southwest is a currently debated topic, but their entry could have occurred as early as the thirteenth to fourteenth centuries (Brugge 1986: Hogan 1986; Winter 1986). Recent surveys record early Athabascan-like sites in the Piedra Lumbre area of the Chama Valley, the Dry Cimarron Valley of northeast New Mexico and southeast Colorado, and within the San Juan River drainage. Research along the Blanco and La Plata drainages and south of Farmington indicate that proto Navajo were present by A.D. 1600 and that the Pre-Revolt "Dinetah Phase" represents a hunting-gathering adaptation linked with some agricultural practices. During this phase, the Navajos lived in forked stick hogans and ramadas and made a plain gray pottery known as Dinetah Utility. No known sites from this era occur in the survey area.

Gobernador Phase

After the Pueblo Revolt of 1680, certain Pueblo Indians took refuge with the Navajos and assimilation of traits from both cultures occurred. The Gobernador Phase is dated from 1680 to 1770. While Gobernador Phase sites are generally associated with the Gobernador and Largo drainages, Navajo refugee sites, including both fortified pueblitos and refugee style construction are known in and around the Chaco Canyon area (Brugge 1986; Reher 1977; Swift 1983, 1986). Other site types dated to this period include burned rock and charcoal concentrations with associated antelope bone and debitage-rich middens recorded on the Navajo Indian Irrigation Project (Gilpin et al. 1984:55), and forked stick hogans dated to 1738 on Chacra Mesa (Bannister 1973).

Cabezon Phase

The Cabezon Phase is placed between 1770 and 1863 (Hester 1962). Between 1800 and 1863, the Navajo economy shifted to a greater dependence on herding with an attendant dependency on a mutton diet and the manufacture of woven blankets (Bailey 1980). Attracted by springs and small lakes, the population fanned out between Chacra Mesa and Mount Taylor, where abundant grama grass provided a favorite winter forage. During this period, Spanish raids continued against the Navajo. Following the signing of the Treaty of Guadalupe Hildalgo in 1846, the established territory of New Mexico was placed under the control of the American military. Both Spanish and American military raids passed through Chaco Canyon en route to the Chuska Mountains. These included the Jose Antonio Vizcarra expedition in 1823, the Colonel Washington expedition in 1849, and the Manuel Chavez expedition in 1860 (McNitt 1972:57, 140, 394). Continued raiding by the Navajo against the American military after the beginning of the Civil War resulted in a vigorous military pursuit under the direction of Colonel Kit Carson. After fields and orchards were burned, sheep and livestock captured and slaughtered, the Navajo surrendered and were incarcerated in a military reservation at Bosque Redondo (Bailey and Bailey 1978:20; Thompson 1976).

Bosque Redondo Phase

The march of the Navajos to the Bosque Redondo reservation began in March 1864. At Bosque Redondo, the American government proposed to teach the incarcerated Navajos Christianity and the practice of agriculture (Thompson 1976:28). In four years' time, the Bosque Redondo "experiment" proved to be a failure. Inadequate food and clothing, fraud, poor

crop production caused by insects, insufficient water, and poor soils were at fault. In July 1868, the Navajos were released and returned to their homeland.

Reservation Phase

The Reservation Phase as defined by York (1986) for the San Juan Basin follows the general hiatus of occupation created by the Bosque Redondo incarceration. Other researchers defined subdivisions marking three eras: 1) The Railroad Era (1881 to 1930), 2) the Great Depression-World War II Era (1930 to 1950), and 3) the Era of Industrialization (1950 to present) (Bailey and Bailey 1982; Kelley 1982). Brugge (1986) recognized similar divisions punctuated by the advent of the First and Second World Wars. According to York (1986:32), these subdivisions are useful because they define the themes which impacted the Navajo productive economy.

After Bosque Redondo, various treaties and legislation were enacted to define a reservation boundary (Swift 1983). Under the terms of the Bosque Redondo Treaty, the Navajos were granted 3.5 million acres; this represents only a portion of the 23 million acres previously occupied and does not include the area in the vicinity of Chaco Canyon. The Dawes Severalty Act of 1887 divided the reservation into 160 acre tracts to be held for 25 years at a time and provided for Indian allotments of public domain lands. Under the terms of this act, the newly established Eastern Navajo Agency sought to secure legal rights for occupants in the eastern off-reservation areas. The bill was amended in 1908 and revoked in 1911 (Correll and Dehiya 1972).

Land ownership is complicated by the granting of alternative and odd numbered 640 acre tracts of the public domain land to the Atlantic and Pacific Railroads for a distance of 40 mi. north and south of the transcontinental railroad route (Mosk 1944:11). These lands passed through the hands of the Santa Fe Railroad Company to the New Mexico Land Company and in 1933 many of them were acquired by the United States Indian Service as Tribal Trust Lands. Sections 16 and 36 of each township were acquired by the Territory of New Mexico under the Ferguson Act of 1898; Sections 2 and 12 were acquired in 1912.

Together, these lands attracted Hispanic and Anglo-American settlement. As settlers took advantage of the grazing resources, conflicts arose, cattlemen's associations were formed, and later these groups acted to block legislative attempts to add the off-reservation areas to the reservation. Under the terms of the 1939 Taylor Grazing Act, which provided for the conservation of grasslands through stock reduction, the practice of granting Navajo allotments on the public domain was ended. This act was closely followed by Land Order 2198 which re-established portions of the public domain for Indian use.

Between 1872 and 1977, a series of federal mineral leasing regulations wrested Indian control of minerals on Indian land and placed it in the hands of the federal government (Swift 1983:27). Specifically, the General Leasing Act of 1920 transferred mineral rights—allotted to Indian administration for Indian lands under the Metalliferous Minerals Leasing Act of 1915—to the federal government. More recently, the 1976 Federal Land Policy and Management Act provided for federal management of unpatented mining claims through the Department of the Interior and Bureau of Land Management.

Navajos returning to the San Juan Basin eastern, off-reservation area were also thrown into the confusion of land claims. Land surveys and trading posts accompanied Anglo settlement in the area around 1870. Near Casamero Pueblo, the Thoreau trading post was established as part of the Hyde expedition chain around 1902. York (1981) gives a detailed discussion of this and other local ranches.

Material goods offered at these stores included house construction materials, tents, tools and equipment including scrapers, sheep shears, plows, wheel barrows, and stoves. These were bartered or traded for blankets and wool. Lumber for house construction was made available upon establishment of a saw mill about ten miles from the Eastern Navajo Agency (near Crownpoint).

Navajos were engaged in wage labor with the American Museum of Natural History excavations in Chaco Canyon. By 1910, it is reported that Navajos in the eastern reservation area had worked on railroads, in lumber camps, in coal mines, on the San Juan irrigation projects, and as freighters for traders (Bailey and Bailey 1978). At this same time, Navajos were living in dome-shaped hogans (which had replaced the older, forked stick variety), also in rough stone houses, and in year-round tent camps.

Wage labor supplemented an economy based primarily on herding. In the years following 1910, sheep and goat herds averaged over 100,000 head per year (Bailey and Bailey 1978). In 1933, the New Deal proposed a plan to provide jobs and address the effects of overgrazing. Sheep herds were reduced; and through the Civilian Conservation Corps (CCC) jobs were offered in reforestation, reseeding, varmint poisoning, dam building, irrigation, and livestock breeding. Nevertheless, Navajo per capita income fell from an average $135 to $80 between 1936 and 1940 (Swift 1983:29). World War II bolstered the economy as wages rose to over $600 a year for war-time endeavors but fell to $80 when the war ended. The effects of World War II employment were seen in the increased participation in the wage labor economy in post-war years. Although automobiles had been acquired as early as the 1930s, during the 1950s an increase was seen in truck purchase and participation in the wage-labor market.

Simultaneously, oil and gas development boomed. Increased access to towns augmented with greater material wealth served to transform the Navajo economy. Increased income led to the acquisition of material items including home furnishings, clothing, indulgences (evident in most trash middens by soda cans), and home construction materials.

A similar change in hogan construction style took place prior to and following World War II. With increased access to wood, the period between 1920 and 1940 was dominated by cribbed log style hogans. These diminished in popularity around the 1940s as stone hogans and stone square style houses became more dominant. Brugge (1980) reports that during the 1940s, several varieties of hogans in the Chaco Canyon vicinity included round stone hogans, round vertical pole hogans, and cribbed log hogans. Square houses were constructed of either stone or poles covered with adobe and mortar. Summer dwellings consisted of a ramada or tent. Contemporary hogans are generally constructed from milled lumber, tar paper, or concrete blocks (Bailey and Bailey 1978).

Expected Resources

Given the long term evidence for occupation in the San Juan Basin, indications of Paleo-Indian, Archaic, Ancestral Pueblo, Navajo, and historic Anglo activities are expected to be recovered during an archaeological reconnaissance. Paleo-Indian finds, in particular, may be isolated manifestations, either on deflated or erosional surfaces. Early Archaic finds may be similarly distributed. It is likely that intact deposits are buried in aggraded valley bottoms or remain intact in dune settings.

Because the survey of the Casamero parcel focuses on a Chacoan community, it is highly likely that the cultural remains associated with this temporal period will constitute the majority of the site types recorded during survey. Site types are expected to be dominated by the community small houses. Early Pueblo remains span a time

that, according to Wells' (1983) study, was between major erosional episodes. Thus Ancestral Pueblo remains will have greater surface visibility. Given the rates of sediment accumulation downslope from badlands, it is possible that the upper portions of structural remains constructed in valley bottoms will still be surface visible, but it is possible that, in this physiographic setting, sediments have accumulated over peripheral features such as hearths or storage cists.

Navajo and historic Hispanic or Anglo settlements will have the greatest surface visibility. In the San Juan Basin, these site types consist of permanent habitations and seasonal camp sites primarily related to herding activities. Other site types include resource extraction areas. Site types not sensitive to archaeological recovery include areas of religious significance to contemporary Native American groups. A study by York and Winter (1988) documents sacred site types which include gathering areas, offering points, sacred areas, and ceremonial areas. Ethnographic consultation is needed for the detection of these sites.

CHAPTER 4

EXCAVATION OF CASAMERO PUEBLO[1]

Anne C. Sigleo

Casamero Pueblo (LA 8779) is a small Chaco-related masonry site situated on a talus slope to the east of Tecolote Mesa in McKinley County. The site is located 4.3 mi. north of Prewitt, New Mexico, in the SE 1/4 of Section 24, T. 24 N., R. 12 W. The ceramic types and masonry at Casamero suggest that the site was occupied from about A.D. 1050 to 1130+. The relationship of this site to those in Chaco Culture National Historical Park located 60 mi. to the north is apparent in the sequence of pottery types, relatively large rooms, T-shaped doorways, a diagonal entryway, a roja ceiling [narrow boards used in place of latillas], and the overall D-shaped plan of the site. Influence from the Mesa Verde area in southern Colorado is seen in the rare examples of McElmo Black-on-white pottery, a limestone tcamahia, and also the T-shaped doorways.

Tecolote Mesa, west of the site, consists primarily of Entrada Sandstone capped by Todilto Limestone. The Todilto Limestone is the primary material used in the construction of the room walls, with blocks of sandstone being used only occasionally. Pintada Springs on the west side of the mesa (Figure 5.3), located in a shallow cave on an exploited east-west trending joint, is the likely water source for the inhabitants of Casamero. The spring comes out between two members of the Entrada about one-third of the way up the mesa and was utilized by local ranchers until recently. The valley east of the site is underlain by the Chinle Formation (Smith 1954).

The flora of the area includes desert juniper (*Juniperus utahensis*), an occasional pine (*Pinus edulis?*), narrowleaf yucca (*Yucca navajoa*), and a variety of grasses. The fauna includes deer, coyote, mountain lion, rabbit, a variety of small rodents, and birds.

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[1]This chapter is an edited version of a report submitted to the Bureau of Land Management (Sigleo 1981).

[2]Casamero Pueblo (LA 8779) was excavated primarily during the summers of 1966 and 1967. It lies on public land, and a permit was obtained from the Department of the Interior for 1966 and 1967. In accordance with the terms of the permit, all of the artifacts are now in the Maxwell Museum of Anthropology at the University of New Mexico.

The purpose of excavating Casamero Pueblo was to instruct members of the Cottonwood Gulch Foundation in the field of archaeological interpretation methods. In addition, the fill of Rooms 2 and 4, and parts of 6, 18, 19, and 20 had been badly disturbed by artifact hunters. It was hoped that a systematic excavation of the remaining rooms would salvage most of the site information. Rooms 1, 3, 5, 7, and parts of 6, 9, and 10 were excavated in 1966. During 1967, a room-size subfloor storage cist in Room 7, Rooms 8 through 16, and the kiva were excavated. Rooms which had been previously vandalized were cleared and photographed. Casamero Pueblo was stabilized by the Bureau of Land Management in 1976 under the supervision of Cheryl Ferguson and Earl Neller of the Bureau of Land Management.

Architecture

Prior to excavation, the approximate outline of Casamero Pueblo was indicated by an irregular mound covered by rubble (Figure 4.1). The site is situated on a low talus slope overlooking the broad expanse of Casamero Draw (Figures 4.2 and 4.3). The site consists of 22 rectangular rooms and at least one kiva (Figure 4.4). The western and northern rooms probably supported a second story. The fill of these rooms, Rooms 1, 3, 5, 7, 9, 12, and 13, contained fallen fireboxes. Rooms 6, 8, and 10 had noticeably fewer wall rocks in the fill, suggesting that no second story had been present. The walls average 15 in. in width, and it is unlikely that they supported a third story. The rooms are unusually rectangular in shape, and relatively large (Table 4.1) by prehistoric standards, a trait characteristic of sites in Chaco Canyon of the same period.

The masonry walls were primarily constructed from blocks of limestone, probably from the talus slope west of the site, although sandstone was used occasionally. The natural cleavage planes of the limestone were utilized so that the wall blocks required little shaping. Finely shaped slabs of Chinle sandstone were used for entryway covers.

The limestone blocks range in size from 5 in. x 4 in. x 3/4 in. to 20 in. x 9 in. x 4 in. They were chinked with small fragments of limestone and, occasionally, pottery sherds (Figure 4.5). Each layer of larger blocks was alternated with layers of chinking, producing a banded effect similar to that of Type 5 (narrow-banded with core) masonry found at Tseh So in Chaco Canyon (Brand et al. 1937; Hawley 1934). Although there is considerable variation in care and degree of banding at Casamero, the walls were carefully faced on both sides, and rubble was often placed in the adobe between the two facings. The walls were also plastered with adobe, which curved around corners and into the floor. Remains of wall plaster were found on the east wall of Room 1, northeast corner of Room 3, the southeast corner of Room 5, the subfloor cist in Room 7, the east wall of Room 9, all walls of Rooms 12 and 13, the west wall of Room 15 and the semicircular chamber accompanying it, the west wall of Room 20, and Kiva A. The walls of Room 12 were white-washed with lime.

All the floors were well plastered with adobe at least twice. The levels were 0.5 to 2.0 in. apart. The floor of Room 12 may have been plastered five times, or each time the walls were plastered.

Subfloor trenches in Rooms 1, 3, and 6, were dug in order to study the wall foundations. These trenches were 4 ft. long, 2 ft. wide, and placed in corners so that two walls could be examined by each. The top inch of fill in each trench contained turkey eggshell fragments, bits of charcoal, and bone fragments. The remaining 18 to 20 in. of hard packed adobe was completely sterile. The trenches went no deeper than about 18 in. below floor level, where fragments of limestone like those on the surface surrounding the site today were found. The trenches indicated that footings for the walls are approximately 18 in. deep and as wide as the walls. Excavations for the foundations were lined with a 0.5 to 2.0 in. layer of ash mixed with mud and were filled with limestone rubble liberally mixed with adobe (Figure 4.6). The neatly coursed masonry walls begin above the rubble about 3 in. below the present floor level. The wall foundations under the south and east walls of Room 6 are similar to those of Rooms 1 and 3 except that the bottom layer of ash and mud was absent. The walls of the storage bin in Room 6, however, have no foundations and were built directly on the floor of the room.

There were two types of ceiling construction at Casamero. The first type used vigas, or log beams, placed across the short axis of the room. These were covered with pinyon and juniper branches overlain by strips of bark, small reeds or grasses, and hard-packed adobe. Unfortunately, there were no viga remains, and it seems probable that these were removed before the pueblo was

Figure 4.1. Casamero Pueblo prior to excavation. Tecolote Mesa is in background. (Chaco Culture NHP Museum Collection, C101896.)

Figure 4.2. Casamero Draw and Casamero Pueblo from Tecolote Mesa. (Chaco Culture NHP Museum Collection, C101897.)

Figure 4.3. Casamero Pueblo facing northeast. Room 1 is in the foreground. (Chaco Culture NHP Museum Collection, C101898.)

Figure 4.4. Casamero Pueblo map. (Chaco Culture NHP Museum Collection, C101899.)

Table 4.1. Room and kiva dimensions.

Room No.	North Wall	South Wall	East Wall	West Wall
Room 1	9'4"	9'3"	21'5"	20'4"
Room 2	9'3"	9'2"	9'8"	9'6"
Room 3	9'3"	9'2"	8'0"	8'1"
Room 4	9'4"	9'5"	10'2"	9'10"
Room 5	9'2"	9'1"	11'3"	11'3"
Room 6	4'3"	9'1"	23'0"	23'0"
Room 7	8'8"	9'0"	20'2"	20'6"
Room 8	8'6"	4'3"	9'3"	9'4"
Room 9	8'11"	9'2"	14'6"	15'2"
Room 10	8'5"	8'6"	8'4"	8'2"
Room 11	8'9"	9'9"	13'11"	13'9"
Room 12	8'9"	8'1"	14'0"	15'2"
Room 13	8'0"	8'8"	13'9"	13'4"
Room 14	4'8"	4'4"	3'7"	3'6"
Room 15	8'1"	7'8"	4'7"	4'0"
Room 16	11'7"	12'1"	7'1"	7'5"
Room 20	8'3"	8'5"	15'8"	14'10"
Kiva	14'8" N-S diam.		14'4" E-W diam.	

burned. The evidence for branch latillas, bark, and reeds consists of charred fragments and impressions of adobe.

A second type of ceiling construction was found in Room 8. In place of latillas, rojas (or narrow boards) were used. Pepper (1920) describes the remains of this type of ceiling (or floor) at Pueblo Bonito in Chaco Canyon as follows:

Figure 4.5. Masonry detail, Room 4. (Chaco Culture NHP Museum Collection, C101900.)

Figure 4.6. Subfloor trench showing wall footings, Room 1. (Chaco Culture NHP Museum Collection, C101901.)

> The material under the adobe was cedar bast, or shredded cedarbark. A very thick layer of this material had been scattered over the floor boards [rojas], before the adobe had been applied . . .
>
> They [the rojas] are made of pine and the sides and ends have been carefully ground with sandstone rasps. The poles [vigas] which upheld the floor boards may be seen directly under them.
>
> The construction of floors of this kind is rather uncommon in Pueblo Bonito, due to the fact that no doubt the manufacture of boards of this nature was a somewhat tedious task. (Pepper 1920:70-71)

The rojas remains at Casamero consist of rectangular pieces of charcoal approximately 2 1/4 x 2 x 1/4 in.

The overall plan of the house block is that of a reversed capital D. A completely fallen masonry wall along the eastern margin of the rooms seems to connect to the two extremities of the house block, forming a D-shaped overall plan. Kiva A is located in the northeastern section of the room block.

Room Descriptions

Room 1

Room 1 contains a 21 in. centrally located circular firepit (Figure 9.1). This firepit is 6 in. deep and well plastered with adobe. The floor was also plastered, and the last habitation surface was covered with ash, charcoal and yellow ochre, and curved into the wall plaster along the eastern wall of the room.

The floor was immediately overlain by two levels of burned roof material. The roof material consisted of pine and pinyon branches overlain by strips of bark, small reeds, and hard packed adobe. Where the pine and pinyon branches had burned completely, parallel latilla impressions were still visible in the adobe. A considerable amount of fire-burned adobe, rock and plastered floor material from the presumed upper story were mixed with the roof fall.

The fill above the roof fall was composed of sand and adobe similar to that of the wall cores and plaster. The top 18 in. of room fill consisted almost entirely of blocks of limestone and smaller pieces of chinking, interspersed with a small amount of adobe. These findings suggest that the adobe comprising the mortar and wall cores washed into the room, and various parts of the upper walls began to fall, after the roof. Because many of the rocks found were in a consistently parallel arrangement, entire sections of wall seemingly fell at the same time.

Room 2

Room 2 had been previously excavated. There is no information on the room fill or features.

Room 3

Room 3 has no floor or wall features. The room is similar to Room 1 (Figure 9.1), with the addition of a fallen firebox 2 to 18 in. above the floor. Located along the eastern half of the south wall, it consisted of ash and nine rectangular fire-blackened rocks, which had apparently fallen from the room above. It is equally possible that cooking was occasionally done on the roof of Room 3, although the abundance of wall rock in the top levels of fill and the number of restorable vessels found above the roof material strongly suggest that there was a second-story room used for food preparation and storage. The ceramics will be discussed in greater detail later. One corrugated vessel was located on the floor in the northeast corner of Room 3, suggesting that the room may have been used as a storeroom.

Room 4

Room 4 had been previously excavated. Although there is no information on the room fill, it did retain a storage bin similar to the one in Room 6. In addition, there is a rectangular stone lined firebox in the center of the east wall.

Room 5

Room 5 was a corn grinding room, as suggested by the dismantled metate bin in the northeast corner. An unusual firepit, 4.5 ft. from the southeast corner, seems to be partially rectangular and stone lined on the northern half. It is possible that it was entirely circular and the rocks fell into it when the roof collapsed. The ventilator hole in the east wall connects with Room 6. The fill was similar to that of Room 1, and like Room 3, contained a fallen firebox. The remains of this were found from 8 in. above the floor down to the floor in the southwestern quadrant of the room. It is possible that the room was converted into a storage room when the second story was added. An adolescent was found beneath the floor.

Room 6

Room 6 is the largest room excavated (Figure 4.7). It is separated from Room 8 by the south side of a second storage bin (described with Room 8). About 5 ft. above the floor on the west wall, a projecting wall rock forms a small shelf. The upper levels of fill in the room contained noticeably fewer rocks, possibly indicating that there was not a second story above the room.

Figure 4.8 illustrates the storage bin in the southwestern corner of Room 6. Approximately 4 ft. square, it was probably used to store corn, as are the wooden ones used in the pueblos today. The corn bin is similar to one observed in the house block at site Bc 51 in Chaco Canyon, which also has an adjacent metate bin (see Banister 1965:Figure 2). The south wall of the room contains a blocked doorway (filled with rubble), which originally connected the room with Room 4. It appears to have been blocked at the time the storage bin was constructed.

Room 7

Room 7 was used as a trash room until the abandonment of the site. As in the other western rooms, the top 18 to 20 in. of fill consisted primarily of fallen wall rock. The next level of adobe was underlain by fallen roof material, and then trash consisting of corn cobs, ashes, floor sweepings, broken pottery, bones, and eggshell fragments were found. A small child was found in the trash in the northeast corner. Because the trash was mounded highest immediately in front of the door and pinched out at the north and south walls, the refuse was apparently thrown through the doors on the east wall, which connects with Room 8. The doorway begins 50 in. above the floor of Room 7. It is 18 in. high, 20 in. wide, and 11 ft. 2 in. from the south wall of the room.

The subfloor cist in Room 7 was discovered while clearing the floor. A raised hearth of fire-burned adobe was found on the floor in the center of the southern half of the room. While clearing the northern half of the room, the floor plaster was found to curve into a subrectangular depression 3 ft. 6 in. long, 2 ft. wide, and 6 in. deep. This was lined with fire-blackened rocks which, when removed, revealed a single slab of limestone, 18 by 14 in. Under the horizontal limestone slab was a pear-shaped subfloor cist (Figure 4.9). Its excavated dimensions are 16 in. in diameter at the top, 6 ft 10 in. in diameter at the bottom, and 6 ft. 4 in. deep. The walls had originally been plastered with adobe, the top one half to thirds of which had fallen and formed the top 6 in. of the fill. The remaining 17 in. of fill consisted of trash made up of turkey eggshell fragments, turkey droppings,

Figure 4.7. Room 6 (with storage bin, left part of photograph) was the largest room (facing southwest). (Chaco Culture NHP Museum Collection, C101903.)

Figure 4.8. Storage bin, southwest corner, Room 6. (Chaco Culture NHP Museum Collection, C101902.)

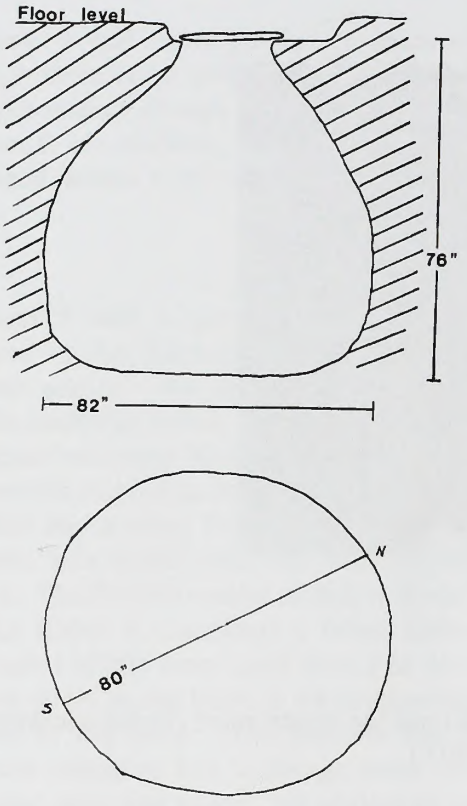

Figure 4.9. Subfloor cist, Room 7. (Chaco Culture NHP Museum Collection C101904.)

floor sweepings of ash, sand ash, sand and charcoal, potsherds, fragments of a basket, chalcedony flakes, scrapers, basalt hammerheads, corncobs, pumpkin seeds, bones, and a wooden handle. The secondary burial of a child associated with an unbroken McElmo bowl and a Gallup bird effigy pitcher or jar were found on top of the trash, but below the level of plaster. The top of the cist, around the opening, was sooty, but the floor was perfectly smooth and showed no signs of a firebox. The secondary use of the cist was obviously that of a refuse area immediately before it was closed. The room above the cist was also used as a refuse area for some time, as estimated by the height (4 ft.) of the trash mound.

Other examples of this type of cist are unusual but not lacking in the Southwest. Reiter (1938) describes a similar jar-shaped cist for the Pueblo IV Period in the Jemez Pueblo of Unshagi, and Stubbs and Stallings (1953) found them at Pindi Pueblo. Reiter (1938) suggests that because the cist was lined with rocks, it may have been used as a temporary water storage tank, perhaps during Navajo raids. Reiter rejects the hypothesis that the cist was a pi-gummie [large, jar-shaped Hopi style] oven because he found no evidence for heat.

Another example found by Roberts (1930) in the Piedras District was plastered and contained some charred corn. A bell-shaped pit is described for Mogollon Village (LA 2579) near Gran Quivira, New Mexico; and LA 2585, 20 mi. west of Chaco Canyon, contains a variety of storage pits of various shapes and sizes (Fenega and Cummings 1956; Wendorf and Lehmer 1956). Because the bottom of the cist at Casamero is about 12 ft. below the surface of the present ground level and seemed to have remained unusually dry, it is possible that it was originally used to store corn or other foodstuffs. Rodent activity may have led to its eventual abandonment.

Room 8

Room 8 is connected to Room 7 by a doorway in its west wall. On its southern side Room 8 is separated from Room 6 by a masonry corn bin, 4 ft. by 4 ft. 6 in. and 3 ft. high. The floor of the corn bin was plastered and curved into the adobe wall plaster. The south wall of the corn bin was built first and seems to have been a half wall separating Rooms 6 and 8. The later two sides of the corn bin abut the first wall and the east wall of the room and are less well constructed than the other walls of the room.

There were two floor levels in this room, 2 to 4 in. apart. Both floors had been well plastered and had bits of ash, charcoal, turkey eggshells, and turkey droppings in them. The uppermost floor has no features, but the bottom floor has a rectangular slab-lined firebox 18 in. by 20 in. and 11 in. deep. This lay directly under the middle of the northern wall of the corn bin. Another lower floor feature is a subfloor cist 3 ft. from both the north and east walls. This is 19 in. deep and approximately 18 in. in diameter and contained a utility pot.

The northern wall of Room 8, which separated it from Room 10, is poorly constructed and seems to have been built at a relatively late point in the occupation of the site. Because the lower level of floor plaster went under the wall that later separated them, Rooms 8 and 10 were originally one room. It appears that when a partition wall was built between the rooms, the half-wall between Room 6 was made into a corn bin and the floor was replastered.

There were 6 to 10 in. of roof material containing rojas pieces above the uppermost floor. This was overlain by equal layers of sand and hardpacked adobe. The remainder of the fill included sand, adobe, and fallen rocks.

Room 9

Room 9 has no floor features, and its only wall feature is a doorway in the center of the east wall. This is 22 in. wide, 25 in. high, and its sill is 3 ft. above the floor. This doorway leads into Room 12. A rectangular sandstone slab, 14 in. by 13 in. by 3/4 in. thick, was found horizontally on the floor and may have been an entryway cover for the room above. Of interest in the fill was a fallen firebox, presumably from the room above, which lay in front of the doorway a few inches above the floor. Because there was no other evidence of use, the room was probably used for storage.

Room 10

Room 10 also has no floor features. It does have two doorways. The one located 2 ft. from the south wall on the east wall is 22 in. across, and its sill is 1 ft. above the floor. This opens onto the plaza. The sill of the second doorway is 8 in. above the floor near the center of the north wall. It is 21 in. across and opens into Room 12. The fill in this room followed the same sequence as that of Room 8 and was unusually sterile.

Room 11

Room 11 was not excavated.

Room 12

Room 12 proved to be one of the most interesting of the excavated rooms. Its walls were plastered at least five times with white plaster. All four walls have retained their plaster, and this is the only room where white plaster was used. The bottom layer (fifth) of the white plaster on the east wall was covered with incised wall drawings on both sides of the T-shaped doorway (Figures 4.10 and 4.11). The primary motif was hand outlines, approximately adult size, along with several geometric figures. There was a single geometric design near the center of the west wall, also in the bottom layer of white wall plaster (Figure 4.12). Other Pueblo III wall drawings have been recorded for Betatakin in Tsegi Canyon, Arizona, at the Aztec National Monument in northern New Mexico, and at Bare Ladder Ruin in Bridges National Monument in southern Utah (P. Schaasfma, personal communication). The incised designs at Bare Ladder Ruin are described as follows:

> In the outer layer of plaster (of Kiva 1) there are a great many geometric designs scratched into it with a sharp

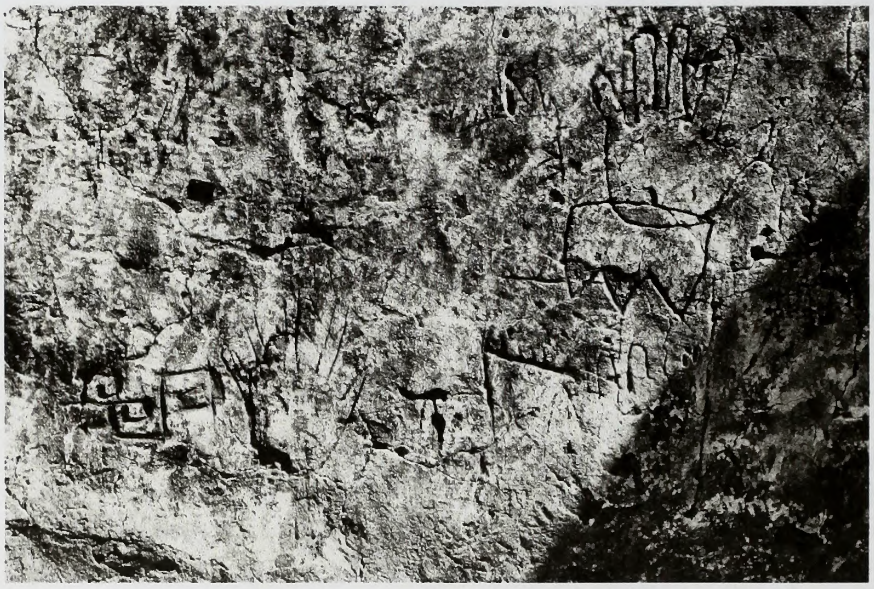

Figure 4.10. Wall incisings, east wall, Room 12. Hands were approximately life size. (Chaco Culture NHP Museum Collection, C101905.)

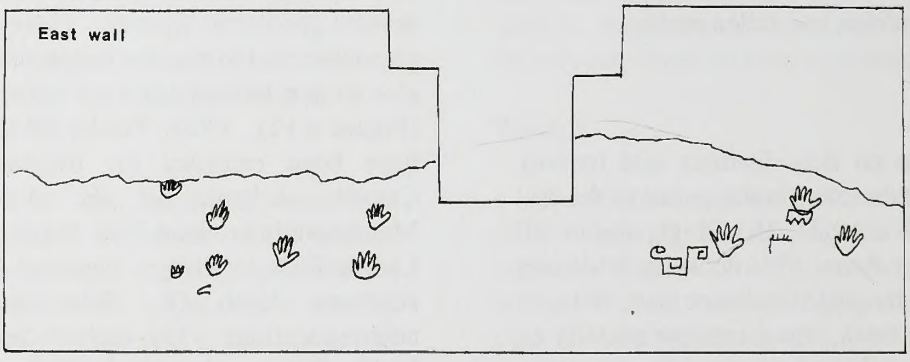

Figure 4.11. Diagram of east wall, Room 12. (ChacoCulture NHP Museum Collection, C 101906.)

Figure 4.12. West wall, Room 12. Motif is 6 in. (10 cm) high. (Chaco Culture NHP Museum Collection, C101907).

> point. All of the incisings are oblong of very complex design, similar in shape and appearance to the embroidery on the ends of ceremonial sashes used by the present day Pueblos (Pierson 1957:228).

Consideration of the motif in Figure 4.12 suggests that the above description from Bare Ladder Ruin is appropriate for the geometric pattern on the west wall of Room 12.

Each of the four walls has a doorway (Figure 9.1). Those in the west and south walls, leading into Rooms 9 and 10, respectively, have already been discussed. The doorways on the north and east walls are both T-shaped, which is a trait that has been observed both in Chaco Canyon and the Mesa Verde areas (Love 1975). The top part of the T-shaped doorway in the northern wall (Figure 4.13) is 23 in. from the west wall of the room, 29 in. across and 30 in. high. The lower part is only 17 in. wide and 26 in. high. The sill is 13 in. above the floor of Room 12.

The T-shaped doorway on the east wall opens into a semicircular area 3 ft. 4 in. in depth and 2 ft. wide. The doorway has not been completely cleared because the masonry above the doorway was not stable. It is 2 ft. wide at the top and 20 in. wide at the bottom. Its sill is 16 in. above the floor, and a protruding rectangular rock between the door sill and the floor forms a small step. The room fill was similar in composition to that of the other rooms, and the great amount of wall rock in the upper 4 ft. of fill suggests that another room was once above it.

Both the T-shaped doorways and white plaster suggest that this room served a ceremonial function.

Room 13

Room 13 contains doorways in three walls, including one in the north wall to the outside of the pueblo (Figures 4.13 and 9.1). There is also a doorway on the west wall, along with two ventilator holes. The T-shaped doorway on the south wall leading to Room 12 has already been discussed. Both the large number of wall rocks in the top 3 ft. of fill and the quantity of roofing material below it suggest that there was a second story above this room. There is a ventilator hole approximately 1 ft. sq. near the south corner of the west wall connecting to Room 11. It would have been located near the ceiling.

The room contained two floors, 12 to 14 in. apart. The top floor curved into the wall plaster in the usual manner, and it was 12 to 14 in. higher than any other floor in the pueblo. It was also level with the bottom of the T-shaped doorway. Floor features included a centrally placed ash pit and a post hole (not indicated on Figure 9.1), containing a post, against the center of the east wall. This post may have supported the floor above the room, or it may have been associated with kiva roof supports.

The fill immediately below the top floor consisted of approximately 6 in. of adobe plaster, underlain by a large quantity of burned roofing material. A partial metate, seven manos, and numerous thin, flat rocks suggest that the original second-story floor contained a metate bin along the west wall. The metate had adobe on the sides and bottom, indicating that it had been plastered into the bin. There was also a fallen firebox in the roof fill. In addition, there were an exceptional number of black-on-white sherds under the charred roofing material and in it. The single

Figure 4.13. T-shaped doorway, north wall, Room 12. Room 13 is through the doorway. (Chaco Culture NHP Museum Collection, C101909.)

floor feature on the bottom floor is an ash pit in the approximate center of the room.

The contents of the fill between the primary and secondary floors in Room 13 indicate that the original roof burned and fell during the occupation of the pueblo. Rather than clearing the debris, the occupants instead filled and leveled the floor with adobe.

Room 14

Room 14 is a closet-sized room only 4.5 ft. by 3.5 ft. A limestone tcamahia found several inches above the floor suggests that the room may have been used to store ceremonial paraphernalia. The room was not large enough for habitation and was most likely used for storage of some variety. The fill differed from that of the other rooms in that it was composed entirely of adobe and windblown sand with very few rocks and no indication of roof material.

Room 15

Room 15 is another relatively small room. It is separated from the semicircular area mention in the discussion for Room 12 by a low wall 3 ft. 4 in. high. The room was filled to the height of the low wall with refuse. A large number of Prewitt Black-on-white sherds were used as wall chinking on the low north wall. There is a small ventilator hole 5 ft. 3 in. above the floor on the west wall of the room. It is 1 in. from the south wall, 13 in. wide, 11 in. high, and connects with Room 12.

Room 16

Room 16 had been partially vandalized before the excavation of the site began. A square firebox, which fell in place from the room above, fortunately remained undisturbed. The firebox was 21 in. on each side, 6 in. high, and located in the center of the floor. A doorway in the west wall of the room has a 22 in. high sill and is 22 in. wide. It led onto the plaza and is directly across from the east doorway of Room 10.

Room 17

Room 17 was filled with rubble during the occupation of the site, apparently to support the kiva wall and the diagonal entryway into the kiva. Vegetation was cleared from the surface, and the room was not further excavated.

Room 18 and 19

The east walls of Rooms 18 and 19 form the eastern boundary of the house block and are badly eroded. The fill of these rooms had been disturbed previously and was cleared partially to reveal the room outlines.

Room 20

The fill in Room 20 had also been disturbed. The western wall of the room contains several interesting features, so the room was completely cleared and photographed. The northern section of the wall has an unusual arched doorway, which may have been formed by overlying rockfall rather than by the site builders. Remaining wall plaster was also visible on this wall, along with the wall abutment of Room 21 to the kiva block.

Rooms 21 and 22

Rooms 21 and 22 were not excavated.

Kiva

A circular kiva is located in the northeastern section of the house block. (See Figure 9.1 for the location of this and another possible kiva in the plaza area.) The keyhole niche on the southeastern side of the kiva, the ventilator opening, deflector trench, two firepits, and a sipapu are all in a line which bears North 30° West (Figures 4.14 and 4.15). The opening for the horizontal portion of the ventilator shaft is 1 in. above the floor, 15 in. wide, and 19 in. high. The opening is capped by a limestone slab lintel. The ventilator shaft extends horizontally under the niche for 5 ft. 9 in., at which point it becomes vertical to the surface. A parallel series of juniper branches averaging 1.5 in. in diameter spanned the short axis of the roof of the shaft. These were unfortunately weakened by exposure to the air and as a result the back part of the niche collapsed. A sandstone slab 14 in. wide and 19 in. high was found resting against the kiva wall a few inches south of the ventilator opening. This fits nicely into the ventilator opening and is presumably a cover for it.

The deflector was probably of organic material and was not preserved. The trench for the deflector is 2 ft. 7 in. long, 3 in. wide and 6 in. deep. Three vertical juniper posts, which presumably supported the deflector screen, were found in the center and each end of the trench. They are 1.25 in. in diameter. Immediately behind the deflector hole is a firepit approximately 15 in. in diameter and 2 in. deep. This had been plastered over by a second floor and is the only feature definitely associated with the lower floor and not found in the upper one. A later firepit northwest of the first is 17 in. in diameter and 7 in. deep. Both were filled with ashes and small bits of charcoal. Northwest of the second firepit is a shallow sipapu 6 in. in diameter (Figure 4.15).

A highly polished limestone slab 13 in. long and 6 in. wide was located just south of the two firepits. It was oriented parallel to the other floor features and imbedded in the floor.

The kiva walls were constructed of the same banded masonry used throughout the site. They were plastered with adobe, which curved sharply into the floor. A bench 3 ft. high and 17 in. wide spans the northwestern third of the wall. The ends of the bench are terminated by vertical walls, although a 4 in. wide shelf connects both ends of the bench to the niche which is approximately the same height.

A diagonal entryway in the south wall of the niche is in a poor state of preservation. This may have been a concealed entryway. Along the southern part of the wall is a closet 5 ft. long, 2.5 ft. wide, which may have been used to store ceremonial paraphernalia. The wall between the closet and the kiva is 7 in. wide and contains a doorway 11 in. wide and 2 ft. 5 in. high. Below the right side of this doorway is a square hole 4 in. on each side. The plaster of this niche had been disturbed, suggesting that its contents had been removed when the pueblo was abandoned. Another hole 17 in. long, 9 in. high, and 16 in. deep is located just above the floor, 2 ft. north of the ventilator opening. It was also empty.

Figure 4.14. Kiva niche and ventilator opening, facing southwest. Note polished slab to the right of the firepits. (Chaco Culture NHP museum Collection, C101910.)

Figure 4.15. Kiva bench; trowel is pointing north. Note polished slab to the left of the firepits. (Chaco Culture NHP Museum Collection, C101911.)

Refuse Areas

Casamero Pueblo has a single sheet trash area located slightly down the talus slope several hundred feet east of Room 20. A second trash area above Casamero appears to be associated with an earlier site nearby and may have been the source of the Pueblo II sherds used in wall chinking and found in room fill. The sheet refuse area for Casamero had been severely vandalized and was not excavated in this study. A cursory examination of the remaining surface sherds indicates an assemblage of types similar to that found within the house block.

In addition to the sheet trash, Room 7 and Room 15 were filled with refuse; in the latter, this possibly functioned to stabilize the outer kiva wall. Both the subfloor cist below Room 7 and the room itself contained refuse consisting primarily of ash from room fireboxes and floor sweepings. Along with the ash were numerous burned corncobs, which were presumably utilized as fuel. Discarded implements, such as scrapers, flakes, manos, and metates were also present, as were pottery sherds. Animal and bird bones include those from desert cottontail, jack-rabbit, prairie dog, dog or coyote, mule deer, turkey, and possible hawk and song birds (Kirk Jones, personal communication). The unusual depth of the subfloor cist was most likely responsible for the preservation of fragments of a coiled basket, a wooden handle, a piece of yucca fiber cord, and a strap around a basalt hammerhead. There were also two child burials in Room 7, one (secondary burial) in the subfloor cist, and a second (primary burial) in the room fill.

Cultural Materials

Ceramics

Sherds from both corrugated utility-cooking wares and white-slipped decorated wares were found in abundance at Casamero. The majority of floor and refuse decorated sherds from Casamero bear a closer relationship to those of the Puerco-Chaco series of Chaco Canyon, rather than the geographically closer Prewitt series described by Hargrave (1964). This observation was consistent with the well constructed veneered masonry and other traits, which point to Casamero as a Chacoan outlier.

The analysis of Casamero decorated wares requires a cautionary word to the effect that sherd frequencies contain Red Mesa and Prewitt black-on-white sherds, which apparently washed into Casamero from a sheet trash area associated with an earlier (non-Chacoan) site. These sherds were utilized also in wall chinking at Casamero, possibly resulting in a higher apparent frequency of these wares.

Gallup Black-on-white is clearly the major type of decorated ware at Casamero (Table 4.2). It comprises 21 percent of the total sherd count, and 70 percent of the identifiable decorated sherds. Other frequently encountered types of pottery are Red Mesa Black-on-white, Prewitt Black-on-white, Escavada Black-on-white, Wingate Black-on-red, and corrugated utility wares. In addition, minor amounts of Chaco Black-on-white, McElmo Black-on-white, Tularosa or Socorro Black-on-white, Puerco Black-on-red, Tusayan Black-on-red, Showlow Black-on-red, San Francisco Red, Flagstaff Red, and Tularosa Patterned Corrugated are also identified (Table 4.3).

Although there was some variation between rooms, the overall site sherd frequencies are indicative of the Pueblo III period in Chaco Canyon (Table 4.4). The distinctive hachured Chaco wares, Gallup Black-on-white, and Chaco Black-on-white (Figure 4.16), are assigned dates of A.D. 1000 to 1130+ and A.D. 1050 to 1130+ respectively (Breternitz 1966; Vivian 1959). Within Chaco Canyon, the Mesa Verde-derived McElmo Black-on-white is the predominant

Table 4. 2. Frequencies of major ceramic types (see also Table 4.3).

Provenience	Ceramic Type						
	Red Mesa B/W	Prewitt B/W	Escavada B/W	Gallup B/W	Wingate B/R	Corrugated	Unidentifiable Gray
Room 1							
Fill	36	1	9	51	1	423	25
Floor	40	7	8	74	6	468	38
Room 3							
Fill	17	1	9	22	1	274	6
Floor	1	-	2	8	3	135	-
Room 5							
Fill	12	2	4	13	1	95	2
Floor	4	-	2	3	-	101	5
Room 6							
Fill	3	6	-	-	-	19	-
Floor	4	-	5	10	3	15	11
Room 7							
Refuse	11	6	14	126	3	507	27
Room 8							
Fill	6	3	1	36	3	54	-
Floor	6	11	10	43	7	331	15
Room 9							
Fill	6	6	16	54	2	280	21
Floor	-	3	4	53	-	130	10
Room 12							
Fill	5	-	-	29	-	137	-
Floor	6	20	19	122	7	446	4
Room 13							
Fill	14	-	-	41	3	108	7
Floor I (top)	1	-	-	3	-	7	2
Floor II	69	-	27	238	1	128	124
Room 15							
Refuse	54	1	6	420	1	671	-
Kiva							
Fill	14	21	12	59	6	153	-
Floor	1	3	4	2	2	38	-
TOTAL	310	91	152	1,407	49	4,520	297
PERCENTAGE (Site)	5%	1%	2%	21%	<1%	66%	4%

Table 4.3. Whole and restorable ceramic vessels.

Type	Shape	Provenience
Decorated		
Red Mesa Black-on-white	Bowl	Room 3
Prewitt Black-on-white	Pitcher	Room 7, subfloor cist
Gallup Black-on-white	Ladle	Room 1
Gallup Black-on-white	Bird effigy pot	Room 7, subfloor cist
Chaco Black-on-white	Mug	Room 7
Gray	Ladle	Room 5
McElmo Black-on-white	Bowl	Room 7, subfloor cist
McElmo Black-on-white	Seed jar (1/2)	Kiva
Wingate Black-on-red	3 bowls	Room 5 (2) Room 12
Black-on-white figure	Animal	Room 5
Utility Vessels		
Corrugated	Ollas	Room 5 (4) Room 3 (4) Room 8 (1)
Tularosa patterned corrugated	Olla	Room 3

painted ceramic type (57 percent) at Kin Kletso. As more material became available, Vivian and Mathews (1965) concluded that McElmo Black-on-white was of local manufacture in Chaco Canyon, and that its manufacture in Chaco coincided with the appearance of classic Chaco Black-on-white between A.D. 1050 and 1090.

The full Chaco assemblage of Escavada Black-on-white, Gallup Black-on-white, Chaco Black-on-white, and McElmo Black-on-white is present at Casamero; but the scarcity of the latter two wares suggests that the tradition for their manufacture had not evolved at the time Casamero's builders left Chaco Canyon. Both Chaco Black-on-white and McElmo Black-on-white, then, appear to be trade wares from Chaco Canyon rather than locally manufactured ceramics. Gallup Black-on-white, on the other hand, is present in sufficient quantities to suggest that it may have been manufactured locally at Casamero.

Although Vivian (1959) assigned dates of A.D. 800 to 950 to Red Mesa Black-on-white within Chaco Canyon, he reports several Red Mesa sherds associated with McElmo Black-on-white dating from A.D. 1050 to 1170 at the Hubbard site north of Chaco. The peak of Red Mesa production, then, may have passed in Chaco, while it continued to survive longer in the outlying areas.

Table 4.4. Dates of ceramic types.

Type	Dates (A.D.)	Reference
Red Mesa Black-on-white	800 - 950	Vivian (1965)
	850 - 1050	McGregor (1965)
Escavada Black-on-white	970 - 1130 +	Vivian (1965)
	1000 - 1100	Colton (1953)
Prewitt Black-on-white	975 - 1050	Hargrave (1964)
Gallup Black-on-white	+1000 - 1130 +	Vivian (1959)
Chaco Black-on-white	1070 - 1130 +	Vivian (1959)
	1050 - 1125	Breternitz (1966)
McElmo Black-on-white	1050 - 1170	Vivian and Mathews (1965)
Wingate Black-on-red	950 - 1050 or 1125	Vivian (1965)
	1050 - 1200	Breternitz (1966)
Puerco Black-on-red	1030 - 1125	Breternitz (1966)
Tusayan Black-on-red	1050 - 1130	Colton (1953)
	1090 - 1285	Breternitz (1966)
Showlow Black-on-red	1100 - 1200	Colton (1953)
	1030 - 1175	Breternitz (1953)
Tularosa Patterned Corrugated	1050 - 1250	Rinaldo and Bluhm (1956)

Wingate Black-on-red is the dominant red trade ware from eastern Arizona (Tables 4.2 and 4.3). Both Wingate Black-on-red and Puerco Black-on-red are the usual association of McElmo Black-on-white and Chaco Black-on-white in Chaco Canyon (Vivian and Mathews 1965).

Indented corrugated culinary ware averages 66 percent of all pottery recovered. It most closely fit the description of Chaco Corrugated (Hawley 1936), and like Gallup, it may have been made locally. In addition to thousands of corrugated sherds, ten restorable corrugated ollas were found. One of these in Room 3 is identified as Tularosa Patterned Corrugated, Reserve variant, which has a limited distribution around the Upper San Francisco River, Blue River, Tularosa River, and Apache Creek (Rinaldo and Bluhm 1956).

One corrugated utility olla was found below the bottom floor level in Room 8. Because the hole in which the jar was found was filled in around the vessel, leaving only its mouth exposed, it was presumably used as a storage cist.

The dates of the ceramic types represented at Casamero are summarized in Table 4.4. Both the Chaco whitewares and the Arizona redwares cluster around a time span beginning before A.D. 1050 (the time when Chaco Black-on-white and McElmo Black-on-white become prevalent), and continuing until about A.D. 1130+. The sherd frequencies are also useful in estimating room

Figure 4.16. Major ceramic types at Casamero Pueblo were Red Mesa Black-on-white (top row), Gallup Black-on-white (middle row), and Chaco Black-on-white (bottom row). (Chaco Culture NHP Museum Collection, C101912.)

use. Specifically, the large number of corrugated sherds and restorable ollas in Rooms 1, 3, and 5 suggest that these rooms and/or the ones above them were utilized for food preparation and storage.

Stone Artifacts

The stone artifacts can be divided into the ground stone implements for food preparation, such as manos and metates, and a chipped stone assemblage for hunting, butchering, and preparing hides (Tables 4.5 and 4.6).

Eleven partial manos were found. Nine of these are made from sandstone, and two from vesicular basalt. All manos, except for one of the basalt ones, are unifaced, and the last is bifaced and triangular in cross section. There are no complete metates, and only six partial ones. Five of the metate pieces are sandstone, and the sixth is basalt. They are plain or slab-shaped like those commonly used in metate bins. The metate from Room 13 (Floor II), retains some of its adobe plaster from the bin, and many of the bin components had fallen around it.

Other ground stone implements include full-grooved hammerstones (or axes), cobble hammerstones, polishing stones for pottery, and a paint palate covered with hematite, which may have been used for mixing the mineral paint used on pottery. A well made arrowshaft-straightener was found in the kiva.

The most interesting ground stone item, however, is a limestone tcamahia (Figure 4.17). Tcamahias appear to be a San Juan-Mesa Verde trait which spread south into Chaco Canyon. Today they are found among the Keres and the Hopi, for whom their function is religious and symbolic of the warrior figure (Ellis 1967a).

After pottery sherds, chipped stone implements are the most numerous artifacts. These implements include scrapers, gravers, flakes, cores, a spear point, a quartz point blank, and three side-notched points. The side-notched projectile points compare in size and form with those that Vivian and Mathews (1965) refer to as "the most characteristic Pueblo III type."

Of particular interest with respect to chipped stone is the relatively popular use of Chinle chert. Chinle chert refers to a distinctive black-spotted, yellow ochre (or occasionally red) chert which comes from Oso Ridge in the Zuni Mountains. It also occurs today as float around the Bluewater Lake area on the north side of the Zuni Mountains, within 15 miles of Casamero Pueblo. Because of its unique appearance and restricted source, Chinle chert was a possible trade item northward to Chaco.

Ornaments

The ornaments include a turquoise bead, a turquoise pendant, half of an incised jet pendant on the kiva floor, two jet pendants in Room 12, two jet beads, four white shell beads, a scalloped red claystone pendant, part of a circular white shell pendant on the kiva floor, part of a bone pendant, and four cylindrical bone beads or whistles. The turquoise and shell beads were bifacially drilled in the traditional manner.

Mineral Specimens

Fragments of the copper minerals, turquoise, malachite, chrysocolla, and azurite, were found (Table 4.7). The nearest source of malachite to Casamero is the Haystack area, which may be seen easily from the site. The azurite may also have come from there, or from the Zuni Mountains, approximately 20 miles southwest of the site. All of these copper minerals were mined prehistorically throughout the Cerrillos, Santa Rita, and Mogollon districts in New Mexico, and the Morenci area on the eastern border of Arizona. Because ceramics from many of these areas were found at Casamero Pueblo, any of them may have been the source of the minerals.

Table 4.5. Ground stone artifacts.

Type	Material	Provenience (Quantity)
Manos	Sandstone[a]	Room 5 (2) Room 7 (4) Room 9 (1) Room 13 (1) Kiva (1)
	Basalt	Room 5 (1) Room 7 (1)
Metates	Sandstone[a]	Room 1 (1) Room 5 (1) Room 6 (2) Room 13 (1)
	Basalt[a]	Trench A, near Room 4
Hammerstones-axes	Sandstone	Room 1
	Basalt[b]	Room 1 Room 7 (2) Room 8
	Quartzite	Room 8 (2)
Polishing stones	Quartzite, chert	Room 7 (2) Room 8 (1) Room 15 (1)
Tcamahia	Limestone	Room 14
Paint palate	Limestone	Room 7
Arrowshaft straightener	Sandstone	Kiva
Beads	Jet	Room 7 (1) Room 8 (1)
	Turquoise	Room 1
Pendants	Jet	Room 12 (2) Kiva (1)
	Turquoise	Room 8
	Red claystone[a]	Room 13

[a] refers to artifacts which are not complete.
[b] full-grooved.

Table 4.6. Chipped stone artifacts.

Type	Material(s)	Provenience (Quantity)
Spear point	Chalcedony	Room 1
Arrowheads (points)	Obsidian, Quartz, Chalcedony (2)	Room 1
		Room 12
		Room 13
		Kiva
Scrapers[a]	Chinle chert[b] (53)	Room 1 (1)
		Room 6 (1)
		Room 7 (9)
		Room 8 (11)
		Room 9 (3)
		Room 12 (6)
		Room 13 (11)
		Room 15 (4)
		Kiva bench (7)
	Gray chert (26)	Room 3 (3)
		Room 7 (5)
		Room 9 (1)
		Room 12 (3)
		Room 13 (8)
		Room 15 (6)
	Miscellaneous chert, quartzite (14)	Room 5 (2)
		Room 6 (2)
		Room 7 (1)
		Room 8 (3)
		Room 12 (2)
		Room 13 (3)
		Room 15 (1)
		Kiva (1)
Knife blade	Gray chert	Room 8
Gravers	Chinle chert[b]	Room 7 (1)
		Room 8 (5)
		Kiva (2)
	Red chert	Room 7 (1)
		Room 8 (1)
Flakes	Chinle chert[b]	Room 7 (1)
		Room 8 (6)
	Gray chert	Room 7 (1)
		Room 8 (6)
		Room 12 (7)
		Room 15 (5)
	Miscellaneous chert	Room 7 (1)
		Room 15 (1)
Cores	Chinle chert[b]	Room 9
	Gray chert	Room 12, floor

[a] includes cutting implements.
[b] Chinle chert refers to a distinctive yellow ochre chert with black spots, found by the author in float around Oso Ridge in the Zuni Mountains.

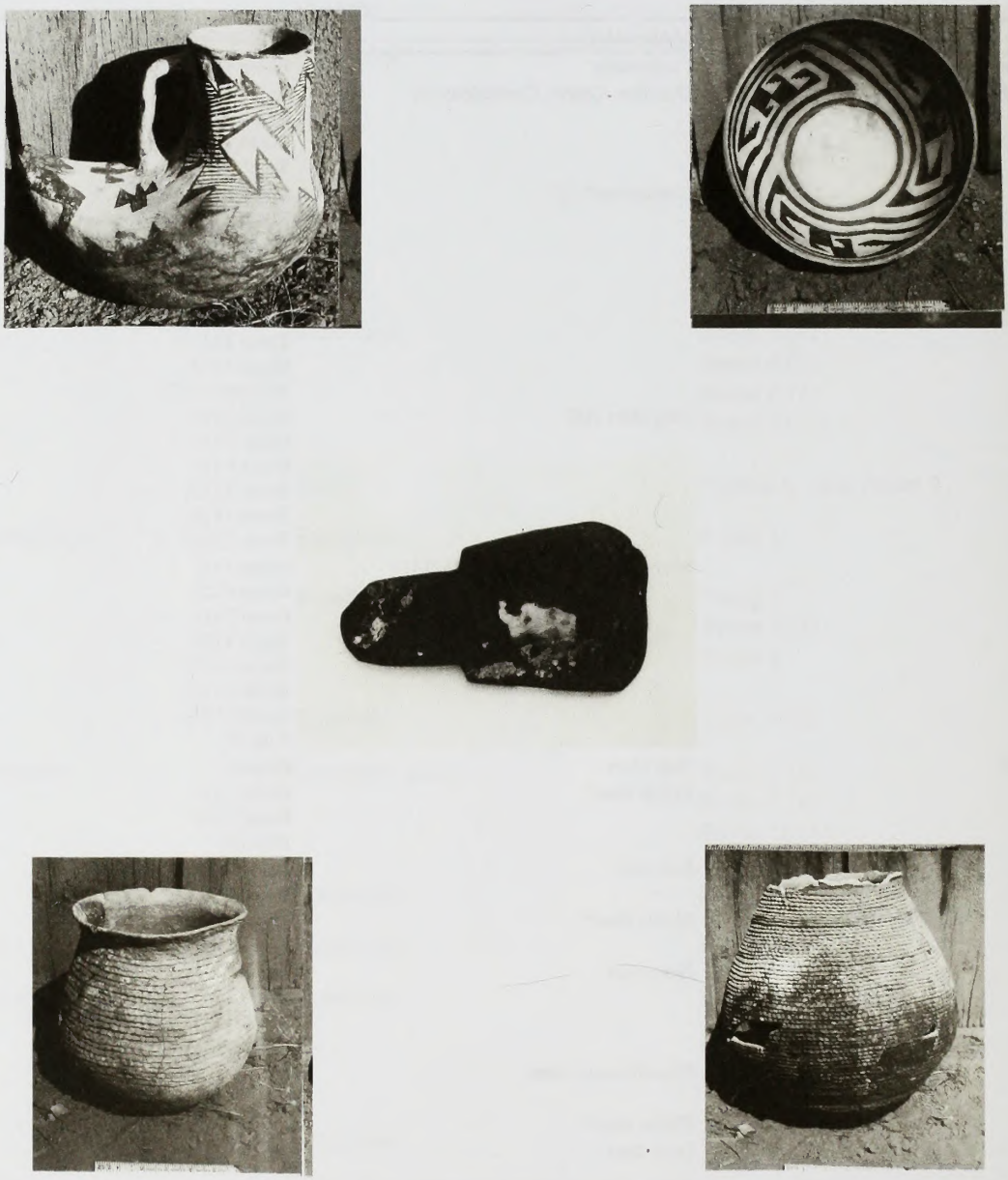

Figure 4.17. Artifacts from the subfloor cist, Room 7, included a Gallup Black-on-white bird effigy pot (top left) and a McElmo Black-on-white bowl (top right). The tcamahia from Room 4 was 6 in. in length (middle left). The bottom row illustrates two typical restored corrugated utility ollas. (Chaco Culture NHP Museum Collection, C101913.)

Table 4.7. Mineral specimens.

Mineral	Provenience
Turquoise	Room 1 Room 8 Room 12
Malachite	Room 1 Room 12 Kiva
Azurite	Room 6 Room 13
Chrysocolla	Room 8
Hematite	Room 9
Limonite	Room 5 Room 6
Jet	Room 7 Room 12
Talc	Room 3 (filled a utility vessel) Room 7
Gypsum	Room 5 Room 15
Calcite	Room 7

The iron minerals, hematite and limonite, occur around Gallup and Grants in Todilto limestone, the material commonly used as wall rocks at Casamero Pueblo. The calcite and selenite gypsum are both prevalent throughout McKinley County. The many pieces of jet found in a corner of Room 7 may have originated either in the coal seams in the Chaco Canyon or from the area around the present pueblo of Acoma (Northrop 1959). Jet was used for ornaments as shown by the spherical jet bead and pendants. Turquoise was used throughout the southwest for beads, pendants, or other ornaments, and it was also used in paint. Malachite, azurite, hematite, limonite, calcite, and gypsum also were used in paint.

Fragments of talc completely filled a large corrugated olla in the fill of Room 3. The Cerrillos District of New Mexico is the nearest recorded source of the mineral, and it is interesting to note that this is also the probable source for the turquoise (Northrop 1959). As with the gypsum and calcite, the talc may have been used in making white paint (Florence Ellis, personal communication), although Bourke suggested that it was being used as a ceramic tempering material at Zuni in the 1890s (Bloom 1934).

Bone, Wood, and Fiber Artifacts

The majority of bone artifacts are awls (Table 4.8), which were distributed throughout the site. One unusually long awl (8 in.) was found on the floor of Room 12 and may have been a weaving tool. A large deer bone had been utilized as a scraper, possibly for smoothing hides, and several small tabular pieces of worked bone were arbitrarily named gaming pieces. A two-prong deer antler found in the kiva appears to have been used for chipping stone.

Fragments of a three-rod coiled basket were found on the underside of a basalt metate in the subfloor cist in Room 7. There are no visible designs on the baskets. A length of poorly preserved yucca cord was found near the burial in the cist. A wooden handle, presumably for a hammer, and a bark strap on a basalt hammerhead were also found in the subfloor cist.

Vegetal Remains

Roofing materials from most rooms had been burned. Some remains could be identified as cottonwood or juniper and grass or bark matting.

Evidence of vegetable foodstuffs is common throughout the site (Table 4.9). Corn kernels were found in Room 10, and over three hundred burned corncobs were found, mostly in the trash in Rooms 7 and 15. All of these seem to be of the twelve-row variety, even though several ends had only five rows. Pumpkin seeds, pinon nut shells, and squash rind were also found in the subfloor cist in Room 7. Unidentified seeds were found in Rooms 7 and 8.

Burials

Numerous skeletons were reported by local residents (the Elkins family) to have been found in a large cave on Tecolote Mesa. This cave was formed by the northernmost hollow on the east side of the mesa (Figure 4.1). Unfortunately, this cave had been badly vandalized and therefore was not excavated by our group. The sheet trash area east of the site also contained burials, but like the cave, these had also been vandalized.

Within the house block, however, three human skeletons were uncovered. The first is that of an adolescent male lying face down in Room 5. The head, which shows occipital deformation, was facing north. The right leg and foot were bent under the skeleton and were found separately on the floor while most of it was 6 to 8 in. above the floor. It was oriented with its head to the west of the body, and both arms and legs were bent. The two possible burial offerings are a Wingate Black-on-red bowl and a plain gray ladle, near the right foot of the skeleton.

The second burial is that of a very small child found in the trash in the northwest corner of Room 7. This was unfortunately removed by vandals over a weekend. The skeleton was accompanied by a miniature Chaco Black-on-white mug (6 in. high) and a plain gray ladle. Judging from what was left of the burial, the child had been flexed with its head pointing south and facing towards the east.

Most of the skeleton of a second human child was uncovered in the top level of the refuse in Room 7's subfloor cist. The burial was either secondary, or disturbed, and most of the bones were randomly scattered. The skull had been disconnected from the mandible and the body was lying face down with its top pointing south. The skeleton is that of a deformed or diseased child, and several teeth have caries. Associated with the burial were a Gallup Black-on-white bird effigy pot and a McElmo Black-on-white bowl (Figure 4.17, top row).

Environmental Conditions

Analysis of the unworked bone material from the summer of 1967 indicates that the majority came from jackrabbits, cottontail rabbits, and

Table 4.8. Worked shell, bone, wood, and fibers.

Type	Material	Provenience (Quantity)
Beads: round	Shell	Room 1 (1) Room 5 (1) Room 7 (2) Room 13 (2)
cylindrical	Bone	Room 7 (1) Room 8 (1) Room 13 (1) Kiva (1)
Pendants	Shell	Room 7 (1) Kiva (1)
	Bone[a]	Room 15
Awls (3 complete)	Bone[a]	Room 3 (1) Room 5 (1) Room 6 (1) Room 7 (1) Room 8 (2) Room 12 (1) Kiva (1)
Scraper	Bone	Room 15
Knapper	Antler	Kiva
Hammer handle	Wood	Room 7, subfloor cist
Coiled basket[b]	Fibers, 3-rod	Room 7, subfloor cist
Cord	Yucca fibers	Room 7, subfloor cist
Hammer strap	Bark	Room 7, subfloor cist

[a] incomplete artifacts.
[b] fragments.

prairie dogs (Table 4.10). Woodrat, kangaroo rat, gopher, dog, deer, and turkey remains were also identified. Several large bird bones were tentatively identified as hawk, and some small bird bones were attributed to small song birds. There were no reptile, amphibian, or turtle remains. These results indicate typical fauna for a mixed grassland-juniper edge cold desert, similar to conditions around Casamero today. Based on the faunal data, the environmental conditions do not appear to have shifted any significant amount from A.D. 1040 until the present (Kirk Jones, personal communication).

Table 4.9. Seeds, vegetable matter, shells.

Material	Provenience
Corncobs (burned)	Throughout, especially in refuse in Rooms 7 and 15
Corn kernels (4)	Room 8 Room 10
Pumpkin seeds (3)	Room 7, subfloor cist
Pinon nut shells (2)	Room 7, subfloor cist
Squash rind	Room 7
Seeds (unidentified)	Room 7 Room 8
Turkey eggshell fragments	Throughout site
Freshwater gastropods	Room 1 Room 3 Room 7 Room 10 Kiva
Olivella shell	Room 13

The pollen analysis of a sample from the corn bin in Room 8 also suggest that environmental conditions during the eleventh century were similar to those of today. The most abundant type of pollen comes from cheno-ams (40 percent), a term used for common weedy plants of the *Chenopodiaceae* and *Amaranthaceae* families. These plant types produce a large quantity of pollen and are expected to be heavily represented. *Juniperus* (juniper) and *Graminae* (grasses, including corn) pollen types are also prevalent. Small amounts of *Compositae* (composite family), *Ambrosia* (ragweed), and *Artemesia* (desert sages) are identified also.

A brief survey of the plants growing around Casamero Pueblo today identifies the following: grama grass, mesquite, Utah juniper, pinyon pine, prickly pear cactus, Englemans cactus, barrel cactus, cholla, and yucca. These indeed suggest a mixed grassland-juniper edge desert, similar to the site's faunal remains.

Discussion

The settlement of Casamero occurred at a time which corresponded to a surge of building within Chaco Canyon, around A.D. 1050. The introduction in Chaco of cored, faced masonry coincided with this expansion and remodeling phase (Hawley 1934; Vivian 1970). The walls at Casamero are also of cored, faced masonry, indicating that the site was built after the introduction of this type of construction in Chaco. Although there is considerable variation in masonry veneers at Casamero, the narrow-banded with core masonry defined for Chetro Ketl in Chaco Canyon is recognizable also at Casamero, particularly in the long wall forming the west sides of Rooms 2, 4, 6, 8, and 10. This wall also comprises the east wall of Rooms 1, 3, 5, 7, and 9, which are the earliest rooms at Casamero based on wall abutments. Hawley (1934) assigned dates of A.D. 1030 to 1070 for the construction of narrow-banded with core masonry at Chetro Ketl, and the

Table 4.10. Unworked bone material.[a]

Species	Common name	Provenience
Sylvilagus auduboni	Desert cottontail	Room 7 Room 8 Room 9 Room 10 Room 12 Room 14 Room 15 Room 16 Room 17
Lepus californicus	Blacktail jackrabbit	Room 7 Room 8 Room 9 Room 12 Room 14 Room 15 Room 16 Room 7 cist had 4 skulls
Cynomys ludovicianus	Blacktail prairie dog	Room 7 Room 8 Room 8 Room 10 Room 12
Geomys arenaruys[b]	Desert pocket gopher	Room 9 Room 12 Room 14 Room 15
Dipodomys ordii[c]	Ord's kangaroo rat	Room 8 Room 9 Room 14
Neotoma sp.	Wood-rat	Room 12
Canis sp.	Dog, possibly coyote	Room 7 Room 8 Room 14
Odiocoileus hemionus	Mule deer	Room 7 Room 10
Meleagris gallopavo	Turkey	Trash in Room 7 Trash in Room 15
Miscellaneous bird bones	Possibly hawk, small song birds	Room 7, subfloor cist

[a] Identification by Kirk L. Jones, Biology Dept., University of New Mexico.
[b] Possibly *Geimys bursarius* plains pocket gopher.
[c] Possibly *Diapodomys spectabilis* bannertail kangaroo rat.

Table 4.11. Radiocarbon dates.

Lab Number[a]	Type	Provenience	Date[b]
A-1129	Charcoal	Room 5, Level 9	1030 ± 100 A.D.
A-1138	Charcoal	Room 7, trash	550 ± 150 A.D.
A-1130	Corncobs	Room 7, trash	580 ± 150 A.D.
A-1667	Wood	Room 13, floor	570 ± 90 A.D.

[a] University of Arizona Radiocarbon Laboratory.
[b] Long and Muller (1981).

initial settlement of Casamero was probably within the same range.

The primary ceramics at Casamero are the Chaco Bonito Phase assemblage of Gallup Black-on-white, Chaco Black-on-white, and McElmo Black-on-white, although the latter two types are rare. The ceramic associations indicate that Casamero was inhabited during the manufacture of McElmo Black-on-white, the Arizona red wares, and Tularosa Patterned Corrugated, all of which were first manufactured about A.D. 1050. The site, however, was abandoned before the development of polychromes or glaze wares at the end of the twelfth century.

Radiocarbon dates for Casamero Pueblo show a range of A.D. 550 to 1030±100 (Table 4.11), which is not compatible with other cultural data from the site based on ceramic and masonry types. The date of A.D. 1030± 100 for a burned roof beam from near the floor of Room 5 approximates the expected site occupation date. The three older dates, however, are puzzling. Assuming that all traces of carbonate from limestone wall rocks were removed during the acid pretreatment process, a remaining possibility is that the samples were recycled older wood, or that they were eroded from a much older site.

The Casamero Pueblo stabilization group from the Bureau of Land Management obtained a tree-ring date of A.D. 1040+vv from a charred roof beam from Room 8 (Earl Neller, personal communication). This approximate date for the construction of Room 8 supports the estimated habitation dates based on ceramic and masonry types. When all forms of dating for Casamero are considered, an initial occupation between A.D. 1030 and 1050 seems reasonable.

In addition to masonry wall construction, Casamero has other architectural features in common with Chaco. For example, Bonito Phase sites in Chaco Canyon usually have a plaza area enclosed by stone walls (Judd 1964). Traces of the enclosing stone wall are present also at Casamero. Normal Bonito Phase house blocks average 30 rooms per kiva. Casamero has approximately 28 to 30 rooms for the single kiva, if a partial second story above the western and northern rooms are included in the comparison. In addition, the masonry storage bins with small doorways in Rooms 4 and 6 at Casamero are similar to one in Bc 51 on the south side of Chaco Canyon (see Bannister 1965:Figure 5, Room 49).

Judge (1977) notes that the average room area in the large classic sites at Chaco is 16 to 18 m^2, whereas it is only 7 to 9 m^2 in other southwestern sites. The overall average for Rooms 1 through 13, 16, and 20 at Casamero is 11.2 m^2. However, Rooms 1, 6, and 7 fall within the 18 m^2 range; Rooms 9, 11, 12, 13, and 20 are approximately 11 m^2, and the remaining six rooms average 8 m^2. In short, there is a rather wide range in room areas,

although some of the smaller rooms are the result of later modifications (i.e., Rooms 8 and 10 had originally been one larger room, as had Rooms 3 and 5).

The number of inhabitants at Casamero can be estimated by using the historic pueblo average of 1.9 persons per room (Pierson 1949). At that ratio, a 28 to 30 room pueblo such as Casamero should have housed between 50 and 60 inhabitants. Assuming two to three rooms per family, Casamero may have housed 10 to 12 families.

From the distributions of fireboxes, storage bins, and artifacts, it is possible to estimate room usages. Specifically, fallen fireboxes were found in Rooms 1, 3, 5, 9, 13, and 16, suggesting that these rooms supported a second story whose rooms were used for living quarters and women's activities such as food preparation. In addition, the fill in Rooms 3 and 5 contained a total of 11 restorable vessels, some of which may have fallen from the rooms above. The bottom, interior locations, and general lack of fireboxes, suggest that the western rooms were used for storage, excepting Room 7, which was a trash room. Room 1 is large, contains an ash pit, and may have been used for living or storage space. Rooms 4, 8, and 13 have rectangular fireboxes or circular firepits. Rooms 2 and 4 are small and may have been used for storage; Room 4 also has a masonry storage bin. Room 6 is exceptionally large, and the storage bin in the southwest corner, along with the one at the north end, in Room 8, suggest that the room served the dual functions of corn storage and grinding.

The majority of chipped stone artifacts came from the floors of Rooms 8, 12, and 13, and the kiva bench. The kiva is a known men's working area (Dozier 1970), and it may be inferred that Rooms 12 and 13 were used similarly. Room 12 also shows evidence of ceremonial activity, and both Rooms 12 and 13 are adjacent to the kiva.

The artifact assemblage from Casamero is typical of the Chaco branch of the Ancestral Pueblo people during the Bonito Phase in northeastern New Mexico. The contents of the trash rooms indicate that the inhabitants were subsistence agriculturalists with a traditional pueblo diet of corn and squash, supplemented by turkeys, hunting, and the gathering of pinyon nuts, cactus fruit, and other edible plants. Food preparation implements include manos and metates for corn grinding, and large corrugated ollas for cooking and storage. Some hunting of small mammals and birds was apparently carried out using a bow and arrow, and spears were likely used for large game such as deer or antelope. Fibers were utilized as seen in the basket, hammer strip, and yucca cordage.

Traded items whose likely source was Chaco Canyon include Chaco Black-on-white and McElmo ceramics, and jet, which outcrops in Chaco Canyon. The copper minerals, including turquoise, may have been traded via Chaco, or possibly from the Cerrillos District east of Albuquerque. The red ware ceramics were made in eastern Arizona, and the Tularosa Patterned Corrugated olla came from the Reserve area in southern New Mexico. These traded ceramics indicate that the inhabitants of Casamero had some ties to the west and south. Aside from self-manufactured ceramics, or foodstuffs, the one item which Casamero was suited geographically to export was Chinle chert. This black-spotted ochre chert is generally found in the Zuni Mountains, although it is also abundant as float around Bluewater Lake, 15 miles south of the site.

A well developed ceremonial life is suggested by the kiva and the incising on the walls of Room 12. The kiva is not a classic Chaco one with a complete bench and pilasters. The kiva bench at Casamero goes one-third of the way around and shows no evidence of pilasters. The kiva has a keyhole niche pointing southeast, an above-floor ventilator opening, two "closets," and

a sipapu, suggesting some San Juan-Mesa Verde influence. There is also an unusual diagonal entryway pointing south-southeast.

In addition to the kiva, Room 12 shows evidence of ceremonial use. Instead of the usual adobe wall plaster, the walls of Room 12 had been plastered at least five times with bright white lime. The bottom layer of plaster contained incised drawings of hands and geometric motifs, and the north and east walls have T-shaped doorways. This doorway shape is thought to be a Mesa Verdean-Chacoan trait that diffused southward. It carried with it a religious-ceremonial connotation which may have represented a rain-fertility symbol (Love 1975). Certainly this suggestion is sustained at Casamero where the unusual white plaster also implies a ceremonial or societal room usage.

One artifact with ceremonial connotation, the hoe-shaped tcamahia, also is considered a Mesa Verde trait which spread south into Chaco Canyon (Ellis 1967a). The tcamahia is made of Todilto limestone, indicating local manufacture. Ethnographically, the tcamahia has been reported for the Hopi and the Keres Pueblo Indians (Ellis 1967a), and T-shaped doorways still exist at Acoma Pueblo (Love 1975). Additional ethnographic evidence for the southern migration of Chacoan descendants to the Zuni-Acoma area comes from Acoma legends and traditions. Ellis (1967b) reports that the religious leaders of Acoma previously made semi-annual journeys with offerings to an ancient shrine in the Chaco, and to one near the entrance to Mesa Verde. Archaeologically at Zuni, the earlier occupation of the area was of a Chacoan type, at least in terms of ceramics (Reed 1955).

Although a sufficient variety of artifacts was recovered from Casamero Pueblo to provide useful cultural data, the quantity of portable items is low enough to suggest that the site was abandoned in an intentional manner with no intent to return. The emptied niches in the kiva wall also support this suggestion. The reasons for the abandonment of the site are entirely speculative. Water is unlikely to have been a major problem as Pintada Spring was a utilized water source until the late nineteenth century. Subsistence, on the other hand, may have been marginal from the beginning, and agricultural depletion of soil nutrients from adjacent farmland may have discouraged further habitation after several generations.

Judge (1977) postulates that Chaco Canyon was a major trading center during the eleventh and twelfth centuries. If such were the case, then outlier Chacoan sites, like Casamero, may have provided goods or services for the trade network. Accordingly, the factors which resulted in the abandonment of Chaco by A.D. 1150 (Vivian 1970) could have affected marginal sites as well as the main center. In other words, the fate of Casamero's inhabitants may have been influenced by conditions within Chaco Canyon.

In summary, Casamero Pueblo was probably occupied by a small group of people who had migrated from Chaco Canyon around A.D. 1050. This would have been late enough for the Mesa Verde influences to have reached Chaco (Vivian and Mathews 1965). The architecture and artifact assemblage lead to the conclusion that Casamero's population had a well-mixed Ancestral Pueblo heritage. Coexisting with the classic masonry and ceramic traditions which developed over many centuries in Chaco Canyon are T-shaped doorways, kiva features, and the tcamahia of the more northern San Juan-Mesa Verde heritage.

Acknowledgments

I wish to express my appreciation to Mr. Hillis L. Howie, director, Cottonwood Gulch Foundation, for providing the resources and interest to make the excavation possible, and to

Professor J. J. Brody, curator, Maxwell Museum of Anthropology, for his support and suggestions. The expert assistance of Kirk L. Jones, Biology Department, University of New Mexico, is greatly appreciated for the identification of animal bones from the 1967 field season. A special thanks is due to my laboratory assistant for the summer of 1967, Louise Waldenstein.

Photograph courtesy of Tom Obenauf.

CHAPTER 5

CASAMERO PUEBLO ARCHAEOLOGIAL STABILIZATION[1]

Earl Neller

The stabilization of Casamero Pueblo was accompanied by excavation along some of the walls. Artifacts were collected from the fill, and notes were taken on the provenience of the finds and their stratigraphic context. Our laboratory analysis of the artifacts confirms the results of previous research (Sigleo 1981; Chapter 4), while supplying some new information as well. Casamero Pueblo was inhabited from A.D. 1050 to 1125+ by the same culture group that was flourishing in Chaco Canyon at that time. Wood from a fallen roof beam was dated by the Laboratory of Tree-Ring Research at A.D. 1041+vv. Ceramic analysis indicates much of the pottery came from other pueblos, including settlements in the Puerco and Chaco drainages.

The site is important to Southwestern archaeologists because it is a good example of a "Chacoan outlier," an archaeological site associated with Classic Period sites in Chaco Canyon (Bonito Phase) but located in an outlying area peripheral to the canyon. It is particularly useful for research on the cultural systems of the Classic Period because of its small size and short habitation span. The archaeological evidence at Casamero Pueblo is not obscured by the complexity present at larger sites or the confusing array of artifacts often found at sites occupied for several centuries where chronological patterns blend and mix. Important sections of this site remain unexcavated, including the great kiva, and could contain abundant cultural remains and other important archaeological data.

Introduction

Casamero Pueblo is a small pueblo related to the Classic Period Bonito Phase sites in Chaco Culture National Historical Park (Pueblo II, Developmental Pueblo). It is located some 45 miles due south of Pueblo Bonito (Chaco Canyon) in the drainage of the Rio San Jose. The floor plan of Casamero Pueblo is L-shaped and consists of 22 rooms and one kiva (Figure 5.1). The depression of a great kiva lies about 245 feet south of the room block (Figure 5.2). The site is named after the drainage in which it is found, Casamero Draw (Figure 5.3). Casamero was a Navajo leader who lived in the area in the nineteenth century.

Most of Casamero Pueblo has been excavated (Figure 5.4). A. Howard Elam vandalized the site in 1963 and 1966 and took material from Rooms 2 and 4, the southern half of Room 6, the lower levels of Room 7, and various portions of the eastern wing of the site, Rooms 17, 18, 19, and 20. This material should be in Mr. Elam's possession. The Cottonwood Gulch Foundation (a summer camp) conducted excavations for instructional and recreational purposes during the summers of 1966 and 1967. The campers were supervised by Anne Sigleo of the University of New Mexico, and excavated Rooms 1, 3, 5, 7, 8, 9, 10, 12, 14, 15, 16, Kiva A (the clan kiva), and the northern half of Room 6. Sigleo excavated additional portions of the site in 1974 (Room 13). The artifacts are curated in the Maxwell Museum of Anthropology at the University of New Mexico.

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[1]This chapter initially appeared as part of Lester and Neller (1978).

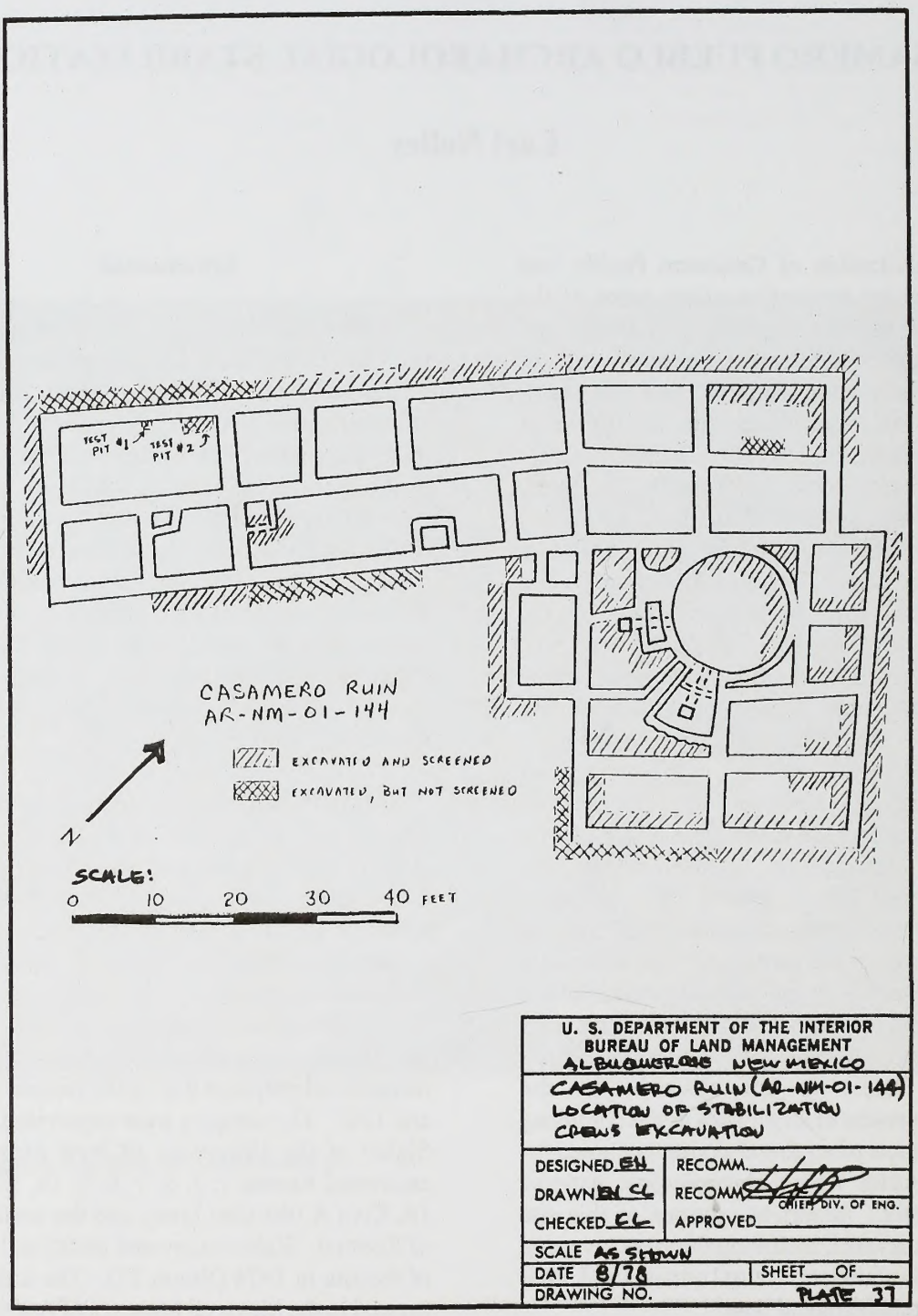


Figure 5.1. Location of excavations associated with stabilization at Casamero Pueblo. (From Lester and Neller 1978.)

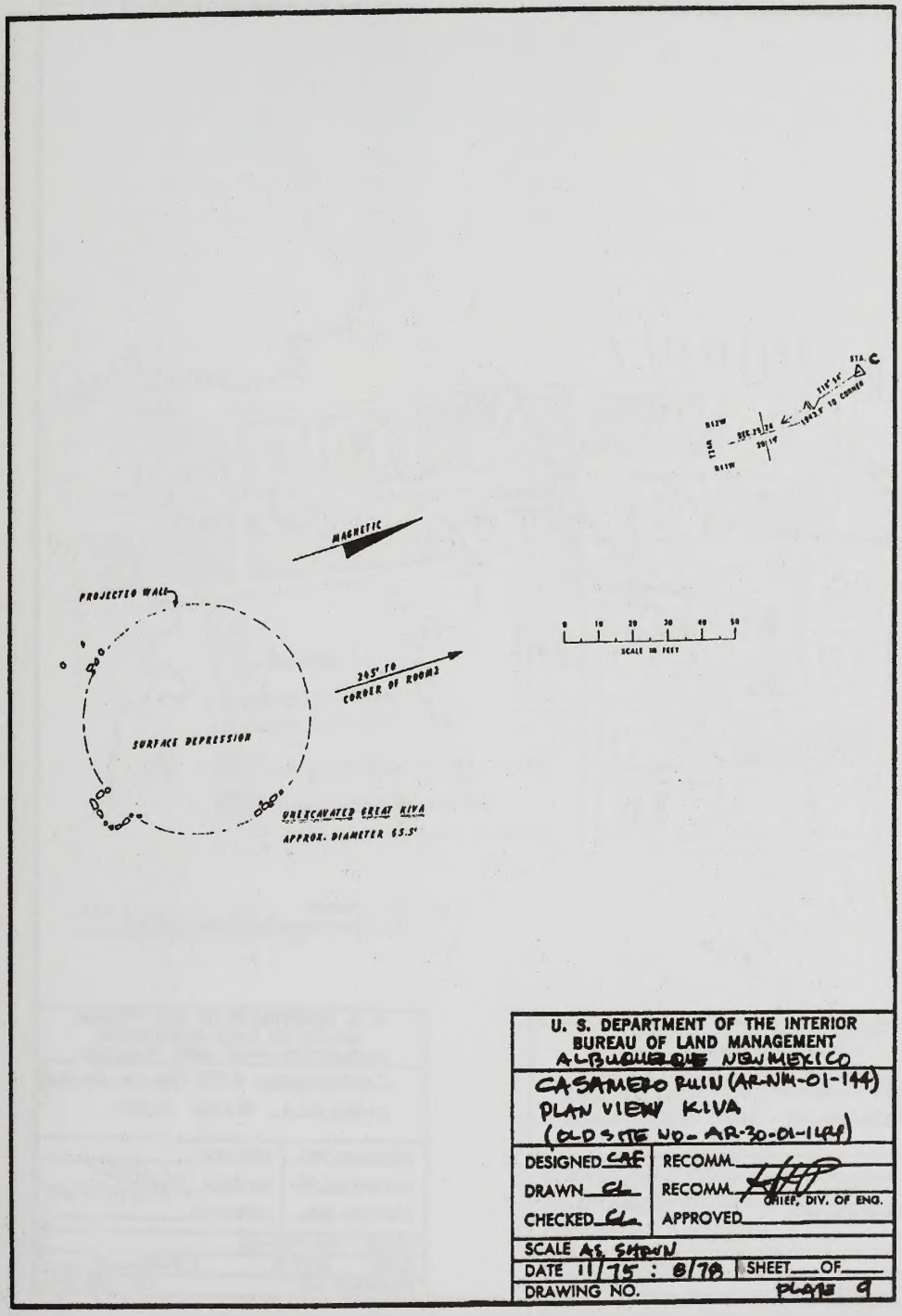


Figure 5.2. Plan view of unexcavated great kiva located 245 ft. south of Casamero Pueblo room block. (From Lester and Neller 1978.)

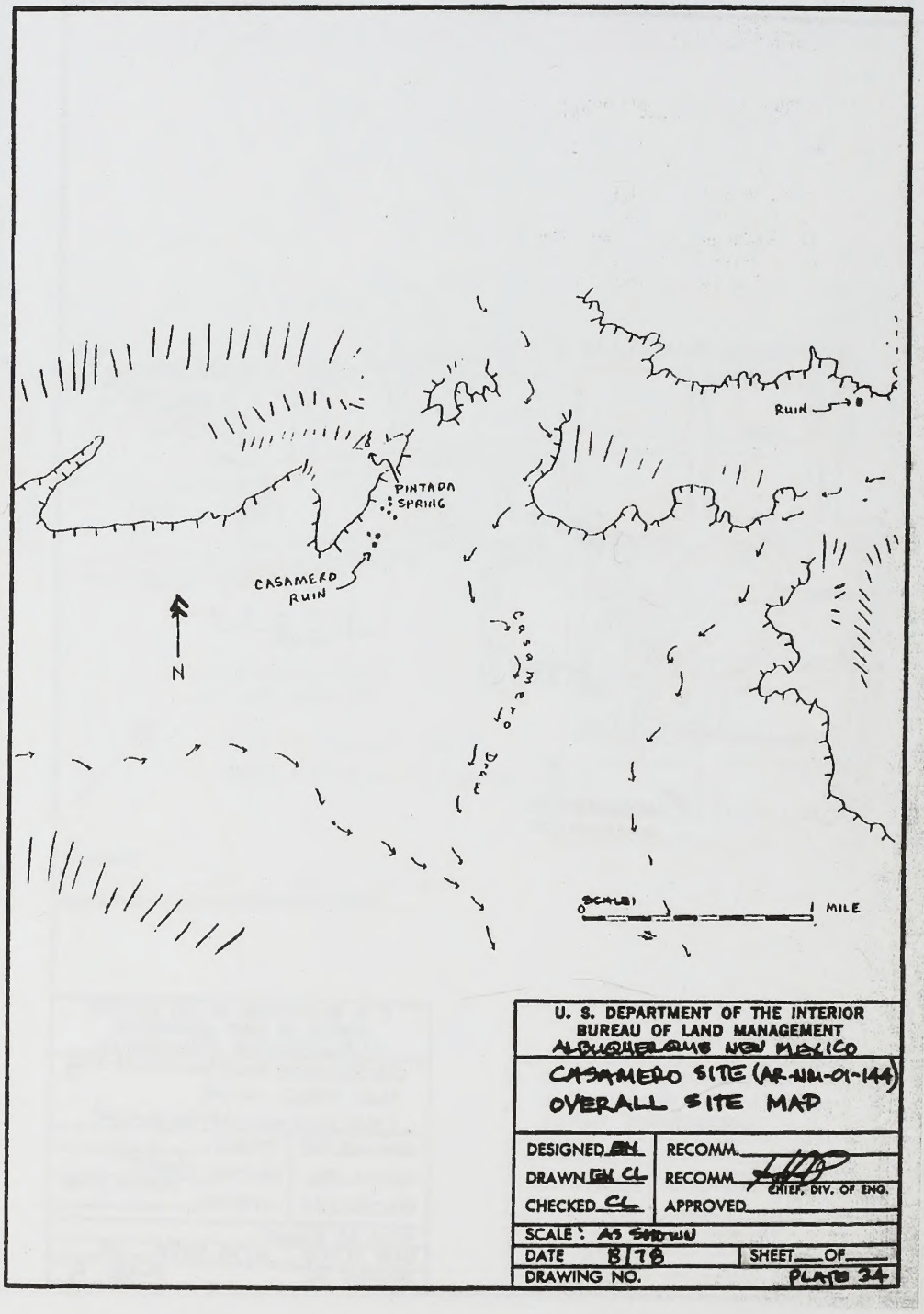


Figure 5.3. Location of Casamero Pueblo in relation to several small houses and Pintada Springs along Casamero Draw. (From Lester and Neller 1978.)

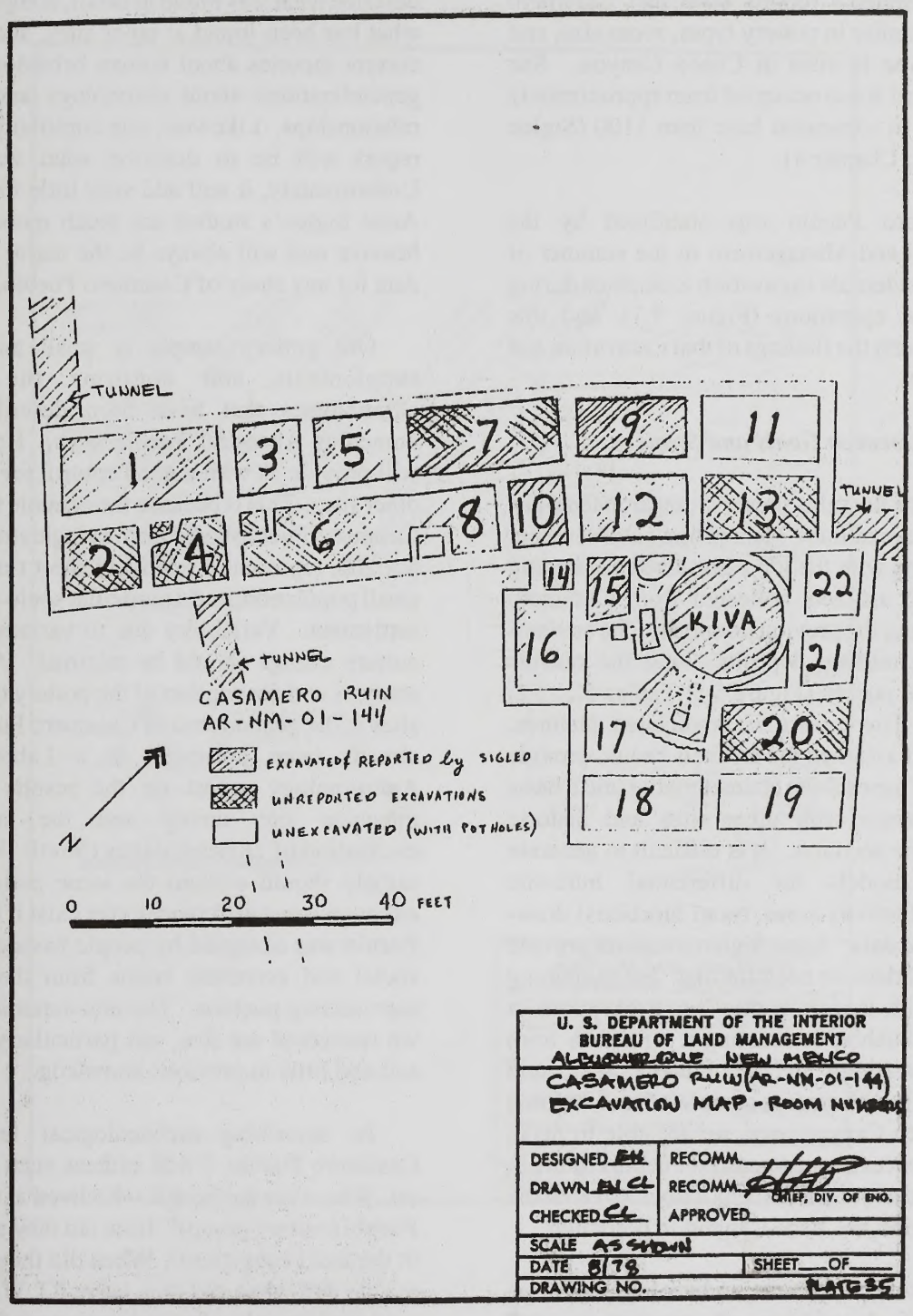


Figure 5.4. Location of excavations carried out at Casamero Pueblo. (From Lester and Neller 1978.)

Anne Sigleo's reports state that Casamero Pueblo is similar in pottery types, room size, and masonry type to sites in Chaco Canyon. She estimates that it was occupied from approximately A.D. 1050 to somewhat later than 1100 (Sigleo 1966, 1967; Chapter 4).

Casamero Pueblo was stabilized by the Bureau of Land Management in the summer of 1976. Considerable excavation took place during stabilization operations (Figure 5.1), and this chapter reports the findings of that excavation and stabilization.

Research Goals and Strategy

I became the ruins preservation archaeologist for the Bureau of Land Management in December 1976. Along with the job came a box containing some 2,000 artifacts collected from Casamero Pueblo during the previous summer. The artifacts came from midden deposits along the outside walls of the pueblo (Figure 5.5; Tables 5.1, 5.2, and 5.3). There were no associated features. Therefore, I assumed the artifacts should provide a sample of general site characteristics and a basis for comparison with other sites and historic ethnographic accounts. It is difficult to generate and test models for differential intra-site utilization (activity areas, room functions) drawing on these data. Anne Sigleo's reports provide the kinds of data we need for that. By combining our data with that from previous excavations at Casamero Pueblo, contrasting it with data from other excavations in the Prewitt area, and comparing it with studies completed and ongoing in the Chaco Canyon area, we are able to make some inferences about Ancestral Pueblo culture in general, and about phenomena associated with the Classic Period in Chaco Canyon in particular.

Present day American archaeology has three aspects: 1) description of excavations and artifacts, 2) analogy between observations made during excavations and ethnographic observations, and 3) the scientific study of cultural processes. Description has dominated most reports which describe what was found in detail, compare it with what has been found at other sites, and draw on current theories about human behavior to make generalizations about chronology and cultural relationships. Likewise, one contribution of this report will be to describe what was found. Unfortunately, it will add very little that is new. Anne Sigleo's studies are much more comprehensive and will always be the major source of data for any study of Casamero Pueblo.

Our pottery sample is small and merely supplements and confirms the pottery chronologies that have been described from numerous Ancestral Pueblo sites. However, it will provide us with a good control for studies at other sites. This is because the ceramic remains at Casamero Pueblo come from a single stratigraphic horizon, represent a relatively short time span, a small population, and a particular socio-economic settlement. Variability due to various kinds of culture change should be minimal. A detailed analysis and description of the pottery types from sites in the general area of Casamero Pueblo have already been presented in a Laboratory of Anthropology report on the results from an intensive site survey and the subsequent excavation of 28 nearby sites (Smith 1964). Our sample should contain the same pottery types, although some differences may exist if Casamero Pueblo was occupied by people having different social and economic status from those in the surrounding pueblos. The non-ceramic artifacts we recovered are few, not particularly unusual, and add little to previous knowledge.

In describing archaeological features at Casamero Pueblo, I will address such questions as: Who were the people who lived at Casamero Pueblo (culture group)? How did they participate in the local ecosystem? When did they build the pueblo and when did they leave it? Was the site occupied for only a few generations as the surface pottery indicates?

In addition to providing a postscript to local archaeological studies, our sample also provides

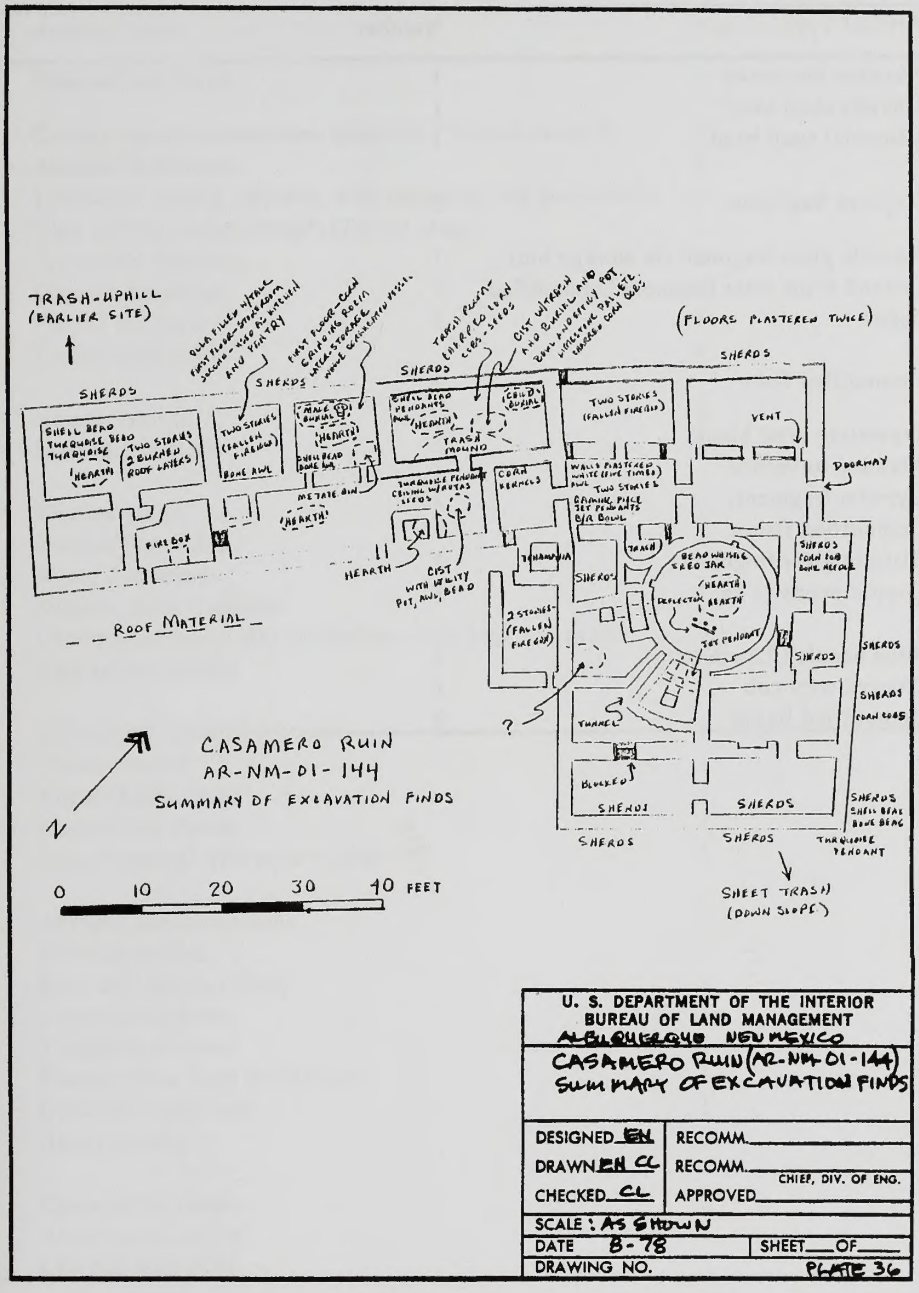


Figure 5.5. Summary of excavation finds at Casamero Pueblo. (From Lester and Neller 1978.)

Table 5.1. Artifacts found during the stabilization of Casamero Pueblo.

Provenience	Artifact Type	Number
Kiva "A"	Abraded limestone	1
	Olivella shell bead	1
	Discoidal shell bead	1
Room 11	Gypsum fragments	2
Room 15	Historic glass fragment (in storage bin)	1
	Ground black slate fragment Unmodified	1
	flakes	3
Room 19	Unmodified flake	1
Room 21	Travertine bead blank	1
	Abraded travertine	1
	Gypsum fragments	2
	Unmodified flakes	2
	Historic glass fragments	2
	Copper penny (1965)	1
Room 22	Bone needle (5.3 cm long)	1
	Charred corn cob	1
	Unmodified flakes	2

Table 5.2. Artifacts found in fill outside of rooms.

Provenience	Artifact Type	Number
Room 3	Unmodified flakes	2
Room 5	Cobble mano/hammerstone fragment ("biscuit mano")	1
	Abraded limestone	2
	Limestone palette, abraded, with striations and peck marks	1
	Tiny ceramic effigy (frog?) (2.8 cm long)	1
	Travertine fragment	1
	Gypsum fragment	1
	Pinyon nut shell	1
	Unmodified flakes	4
Room 7	Hammerstones	2
	Unmodified flake	1
Room 11	Hammerstone	1
	Unmodified flakes	4
	Wood fragments	2
	Historic glass fragment	1
	Unfired, unshaped clay vessel base with blue and green pigment on bottom	1
Room 18	Cylindrical hematite pendant	1
	Charred wood	1
	Abraded limestone	1
	Unmodified flakes	3
	Rope fragment with square nails	1
Room 19	Abraded sandstone cone	1
	Abraded pebble	1
	Bone awl (bobcat tibia)	1
	Unmodified flakes	3
	Turquoise pendant	1
	Tubular bone bead (bird bone)	1
	Discoidal shell bead	1
	Hammerstone	1
Room 20	Unmodified flakes	2
	Abraded travertine	1
	Charred corn cobs	2

Table 5.3. Artifacts with no provenience.

Artifact Type	Number
Flake scrapers	2
Unmodified flakes	2
Core	1
Abraded limestone pendant	1
Hammerstones	2
Pink shale pendant	1
Travertine beads (discoidal)	2
Wood fragment	1
Two-handed mano fragment, basalt	1

a supplement to the research project in Chaco Canyon. How do data from Casamero Pueblo prove or disprove theories about cultural development in Chaco Canyon? How was life at Casamero Pueblo dependent upon life in Chaco Canyon? What does the Casamero Pueblo data set tell us about great kivas? These are the questions which guided my analysis of the finds at Casamero Pueblo.

Methods of Data Collection

The location and extent of all excavations were determined by stabilization requirements only. In this way the Bureau of Land Management crew hoped to disturb the site as little as possible. Field notes describe the dimensions and locations of all trenches and the nature of the fill. Backdirt from previous excavations contained no artifacts and was discarded. Other deposits were screened and the artifacts were collected according to relevant site distinctions, i.e., by room and natural levels; see Figure 5.6 for an example. Some irrelevant distinctions were also noted such as depth below an arbitrary datum.

Archaeologists usually confuse the distinction between means and ends, and many will tell you that professional archaeology can be distinguished from vandalism by the professionals' technique of digging according to arbitrary grid systems and levels and the curation of artifacts by museums and universities. To me this is just a form of institutionalized vandalism. The purpose of archaeology is to study prehistoric cultures and cultural processes. Published reports are the desired end-product, not the accumulation of profuse field notes and unopened boxes of artifacts. Established techniques are merely conventions, and in many cases waste valuable time–time that could be better spent elsewhere, getting control samples, doing local reconnaissance, looking at other collections, studying previous reports in the library, or conducting tests in the lab. All these comments are relevant because they provide a basis for discussing what I consider to be a major flaw in most field archeology: the principle of postponed gratification. Most archaeologists dig as if each new site were *tierra incognita* and no decisions should be made until we get everything together "back at the lab." This is a mistake. In the first place, we've done enough digging already to give us a pattern of general site characteristics. I know one archaeologist who can tell you what you'll find in a site, based on surface clues alone; and he'll be right 95 percent of the time (or should I say for 95 percent of the site?). We have learned something in the past 100 years. And in the second place, many excavations produce more questions than they answer because the excavators put description before understanding. How many floors in Room 6? Is the floor in Room 6 contemporary with the floor in Room 12? Was Feature 10 a firepit? Was the mano fragment in Room 2 associated with posthole 3 or the post-occupational fill? These are questions to be answered in the field, not from field notes back at the lab. My main argument

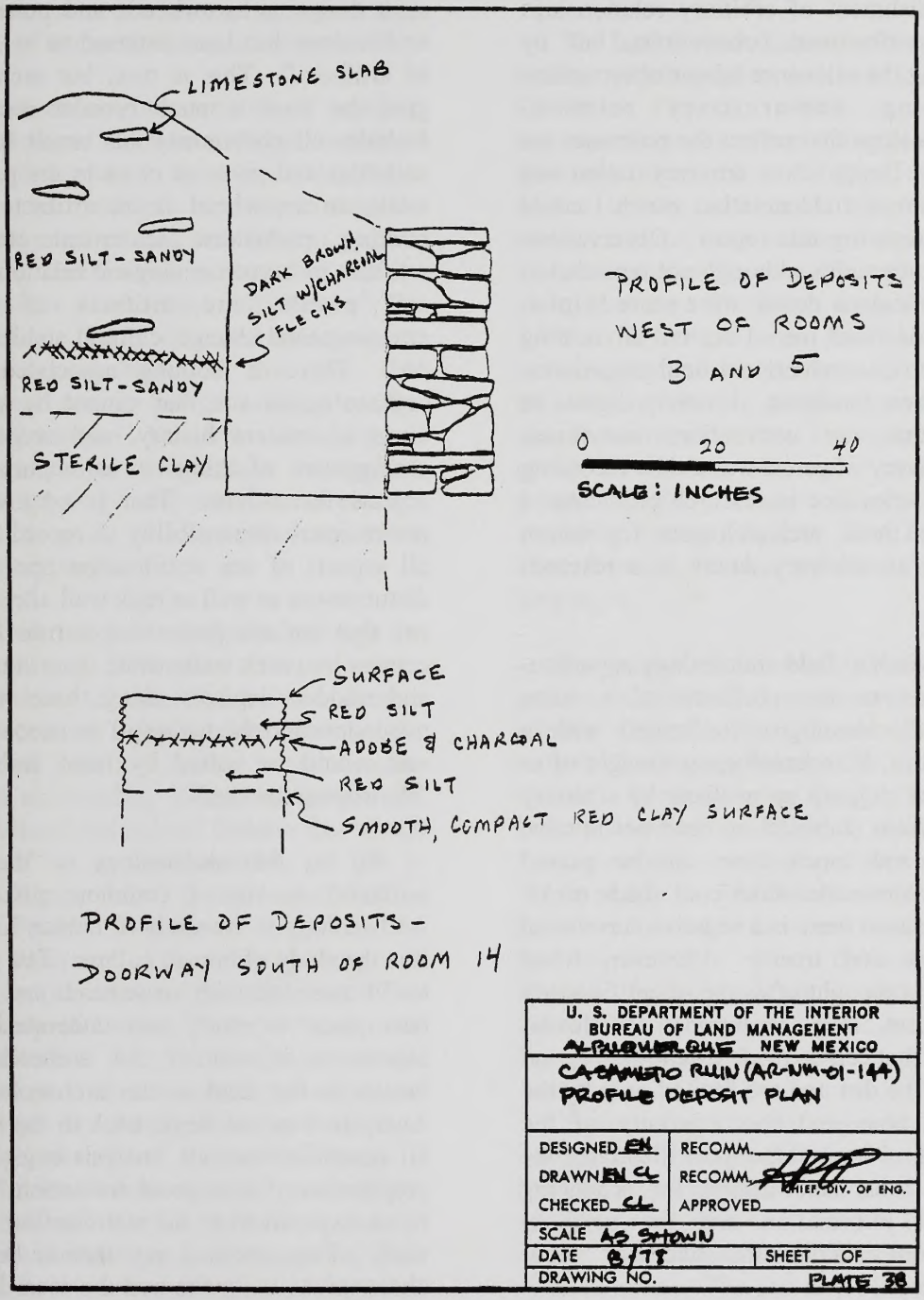


Figure 5.6. Profile of deposits recorded during stabilization: area west of Rooms 3 and 5, and doorway south of Room 14. (From Lester and Neller 1978.)

is this: we extract the maximum amount of archaeological data from a site not by resorting to the establishment of arbitrary relationships and other professional conventions, but by understanding the relevance of our observations and creating non-arbitrary relationships–relationships that reflect the processes we are studying. Depth below arbitrary datum was a time-consuming field notation which I could not use in preparing this report. Observations about site stratigraphy, although not recorded in the same meticulous detail, were more helpful. Don't misunderstand me. I am not advocating we throw out our conventional field procedures. They have their functions. I merely digress to point out that our conventions sometimes impede discovery when we waste time recording data without relevance to research problems. I apologize to those archaeologists for whom depth below an arbitrary datum is a research problem.

My approach to field archaeology is particularly germane to the problems of a ruins stabilization archaeologist confronted with a crumbling ruin. If archaeology is thought of as the science of digging up artifacts by arbitrary levels, then ruins stabilization need not involve archaeology and much time can be passed sipping pink lemonade under cool shade rocks. (Here in the desert there is a negative correlation between sites and trees.) However, when archaeology is thought of as the scientific study of past cultures, then the number of relevant observations that can be made extend far beyond the limits of the dirt and are limited only by the confines of time and the ingenuity of the archaeologist. I hope this report illustrates the potential of ruins stabilization for producing archeological information and the need to approach ruins stabilization like any other research project.

For many archaeological terms, common usage has established meanings quite different from the meanings employed by archaeologists. One of the most commonly used, and misused, term in any discussion of archaeology is "artifact." Artifacts are usually thought to be such things as arrowheads and potsherds, and archaeology has been referred to as "the study of artifacts." This is true, but archaeologists give the term a much broader meaning. It includes all phenomena that result from man's activities and gives us clues to the past so that while an arrowhead is an artifact related to hunting, prehistoric settlement patterns are artifacts of human ecological relationships, and soil profiles are artifacts of site use, environmental change, cultural stability, and so on. There is nothing associated with an archaeological site that cannot be studied for clues to ancient history, and sometimes the arrangement of things is as important as the objects themselves. That is why we have a professional responsibility to record and report all aspects of our stabilization operations–soil disturbances as well as rock wall alterations. To say that we are preserving a ruin by putting cement into rock walls while ignoring the rubble and midden deposits along these walls is to misunderstand the nature of archaeological data and would be called by most archaeologists "destroying the site."

To say that archaeology is "the study of artifacts" is also a common misconception. Archaeology is the study of human history, and it is the study of human culture. The goal is not to fill museums with arrowheads and pots. The best place to study and understand cultural objects is in context; for archeologists this means in the field at the archaeological site. Analysis does not begin back in the lab. As in all scientific research, analysis begins with the preparation of a proposal for action, whether it be an experiment or the stabilization of a stone wall. The reason I say this is because the observations we make and the records we keep are as detailed or as general as our understanding of relevant data and the kinds of analyses that we plan to undertake. Ruins stabilization requires the same kind of preparation we need to begin field research if we

want to take our perception past the realm of passive anticipation. Stabilizing stone walls may be the focus or our labors, but archaeology is the study of human cultures, not stone walls.

I believe these comments about archaeological method and theory are relevant because I want to use this report to show how much information can be recorded, or lost, during the implementation of a ruins stabilization project. Traditionally stabilization reports are treated like weight-loss documents, with "before" and "after" photos, a log of time and money spent, with little recognition of the fact that archaeological data is being observed, manipulated, and destroyed. I want to use this report to show that ruins stabilization is applied, practical archaeology, and needs to be planned with research goals in mind, like any other archaeological project.

I drank my lemonade and sifted through the box of sherds and field notes. They were not enough. Additional data had to be collected. No site exists as an isolated entity ("ask not for whom the bell tolls"). I made a reconnaissance of the area surrounding Casamero Pueblo and recorded cultural and natural features that would be important in my understanding of life at Casamero (Figure 5.7). I also examined the Casamero Pueblo collections stored in the Maxwell Museum of Anthropology in Albuquerque (for which I gratefully acknowledge the help of Marian Rodee). I examined ceramic collections from the Prewitt area stored at the Museum of New Mexico's Laboratory of Anthropology in Santa Fe (for which I acknowledge the help of Stewart Peckham). I talked to Helene Warren about her study of the ceramics in Chaco Canyon (and thank her for her help). I examined the skeletal material from Casamero Pueblo in storage at Maxwell Museum (for which I acknowledge the help of Cheryl Ferguson). And the Chaco Center sent a wood sample to the Laboratory of Tree-Ring Research for dating (and I thank them for this and many other favors throughout this project).

The Natural Environment in the Vicinity of Casamero Pueblo

The land around Casamero Pueblo is part of a large physiographic province known as the Colorado Plateau, which more or less corresponds to the upper drainage basin of the Colorado River. It is a region of rough and broken terrain, with small steep mountainous areas, plateaus, and mesas, intermingled with steep canyon walls, escarpments, and narrow valley bottoms. Elevations range from 6,500 to 7,800 ft. In cultural terms, the Colorado Plateau is the region that was settled and dominated by the Ancestral Pueblo peoples around 900 years ago, the same time when Casamero Pueblo was occupied. Today, this region is the home of people speaking many different languages, including Navajo, Apache, Ute, Paiute, Hopi, Zuni, Keresan, Tanoan, and other Pueblo Indian languages.

Geographically, Casamero Pueblo is located on the borders of three separate geographic regions (Figure 5.8): 1) the Zuni Region, roughly the upper drainage basin of the Little Colorado River including the Zuni River and the Puerco River of the West; 2) the Eastern San Juan, especially the drainage basin of the Chaco Wash; and 3) the Rio Grande, in fact, Casamero Pueblo is located in the upper drainage basin of the Rio San Jose which flows into the Rio Grande. Such a location, on the periphery of three different regions, should be reflected in the archaeology of the site.

Today, all of the drainages in the area are intermittent and usually flow only for short periods following heavy rains. The annual precipitation is low, from 10 to 17 in. Summer is the rainy season, characterized by heavy thunderstorms. The last day of frost is around the first week in May in the spring, and the first day of frost in the fall is around the second week in October.

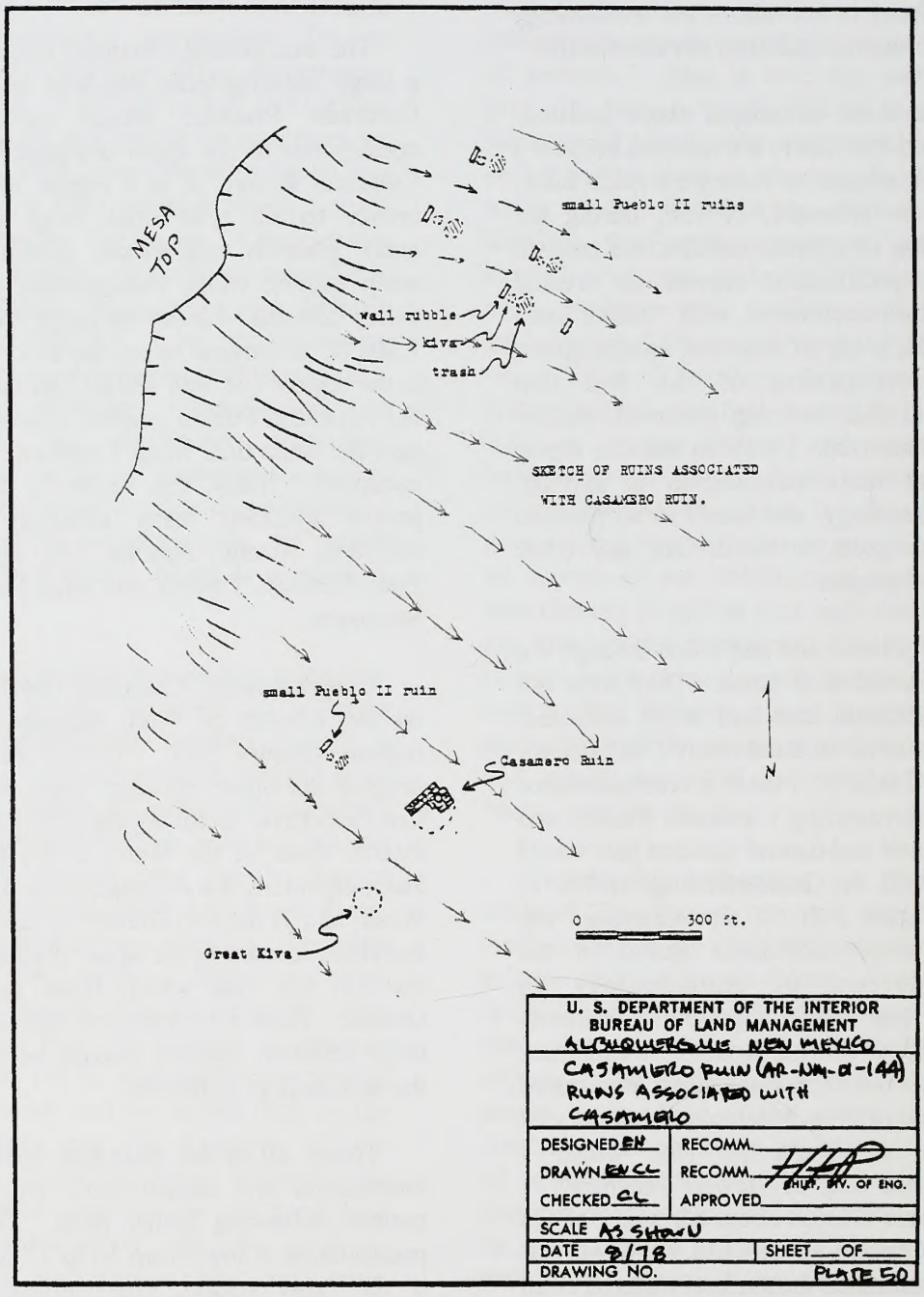


Figure 5.7. Small houses located by Neller during reconnaissance around Casamero Pueblo. (From Lester and Neller 1978.)

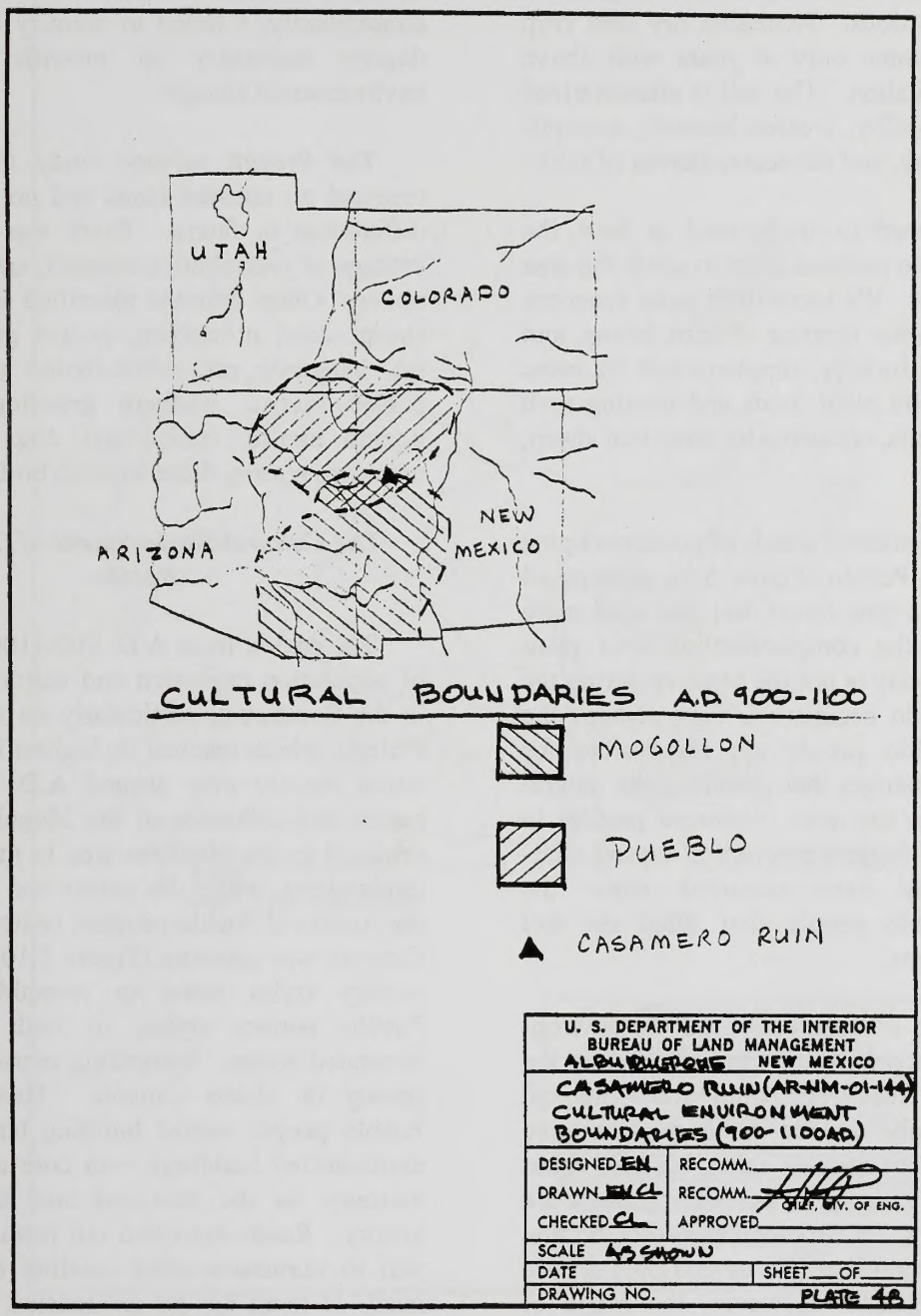


Figure 5.8. Location of Casamero Pueblo on the borders of geographic regions. (From Lester and Neller 1978.)

Most of the land is used for grazing, and it is easy to see why. Farming without irrigation is extremely hazardous. Profitable dry land crop yields would come only in years with above average precipitation. The soil is characterized by low permeability, erosion hazards, susceptibility to flooding, and the accumulation of salts.

What is hard to understand is how the Ancestral Pueblo peoples came to settle the area in the first place. We know their basic economy depended upon the farming of corn, beans, and squash, raising turkeys, supplemented by some gathering of wild plant foods and hunting such animals as rabbits, occasionally mountain sheep, and antelope.

There are scattered stands of ponderosa pine near Casamero Pueblo (Figure 5.9), perhaps all that remain of a pine forest that was once more extensive. If the composition of local plant communities today is not the same as during the Ancestral Pueblo occupation, then perhaps the Ancestral Pueblo people are responsible for initiating the changes that produced the natural environment we see now. Sediment profiles in nearby arroyos suggest changes in topsoil characteristics may have occurred since the Ancestral Pueblo people first tilled the soil around Casamero.

One source of information on the environment in which prehistoric people lived is the bone material recovered from archaeological sites. Not only do the bone remains give information about animals eaten, but also about vegetation and climate. The larger animals are of little value in environmental reconstruction because their natural ranges extend over a wide variety of habitats. However, the range of smaller mammals is restricted because of restricted habitat requirements. Multivariate analyses of skull measurements are useful in identifying small mammal bones to the species level–a necessity for environmental studies. A comparative reference collection of bones is also helpful. My analysis of the bones from Casamero Pueblo was done without the benefit of either of these two research techniques and, consequently, I failed to identify bones to the degree necessary to provide proof for environmental change.

The Prewitt salvage study (Smith 1964) reported no unusual fauna and no stratigraphic differences in fauna. There was a high percentage of jackrabbit, cottontail, and prairie dog bones. Other animals identified were bighorn sheep, deer, pronghorn, pocket gopher, wood rat, kangaroo rat, white-footed mouse, silky pocket mouse, northern grasshopper mouse, pinyon mouse, snake, and dog. For some unknown reason, there were no birds.

The Cultural Environment of Casamero Pueblo

The period from A.D. 900-1100 was a time of population explosion and cultural expansion in the Southwest, particularly on the Colorado Plateau, which reached its highest human population density *ever* around A.D. 1100. The power and influence of the Mogollon peoples, centered in the Mimbres area to the south, was diminishing, while the power and influence of the Ancestral Pueblo peoples, centered in Chaco Canyon, was growing (Figure 5.10). Mogollon pottery styles came to resemble Ancestral Pueblo pottery styles, in both utility and decorated wares. Something unusual was happening in Chaco Canyon. These Ancestral Pueblo people started building large, planned, multi-storied buildings with core and veneered masonry for the first and only time in their history. Roads branched out from Chaco Canyon to numerous other satellite communities, many of them having an unusual architectural feature known as a "tower kiva," and many of them (such as Casamero Pueblo) associated with a new kind of structure known as an "isolated great kiva" (Figure 5.2). Macaws and copper bells were imported from Mexico, along with some unusual pottery styles. Archaeologists favor two explanations for the Chaco Canyon

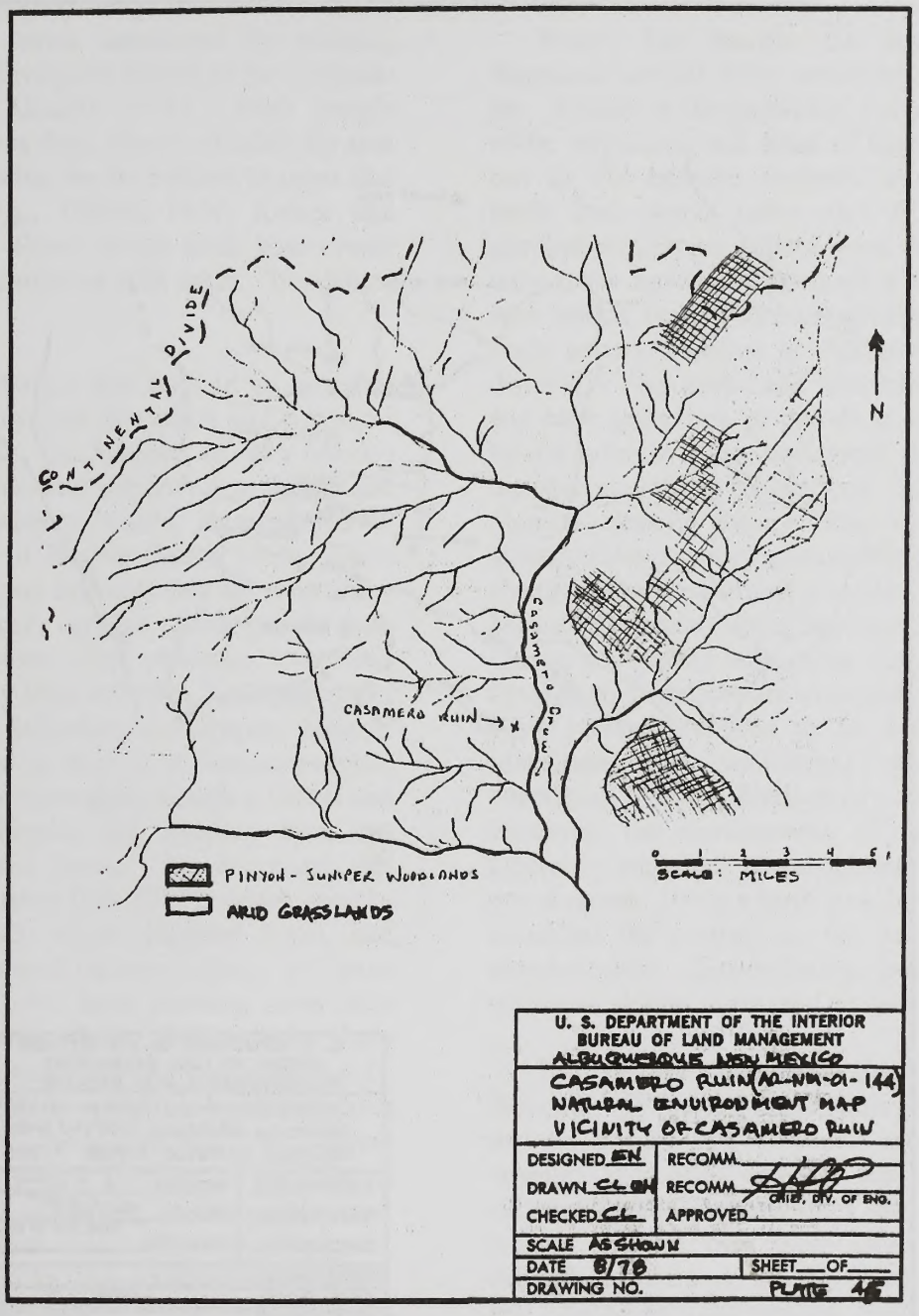


Figure 5.9. Location of Casamero Pueblo with regard to pinyon-juniper woodland and arid grasslands. (From Lester and Neller 1978.)

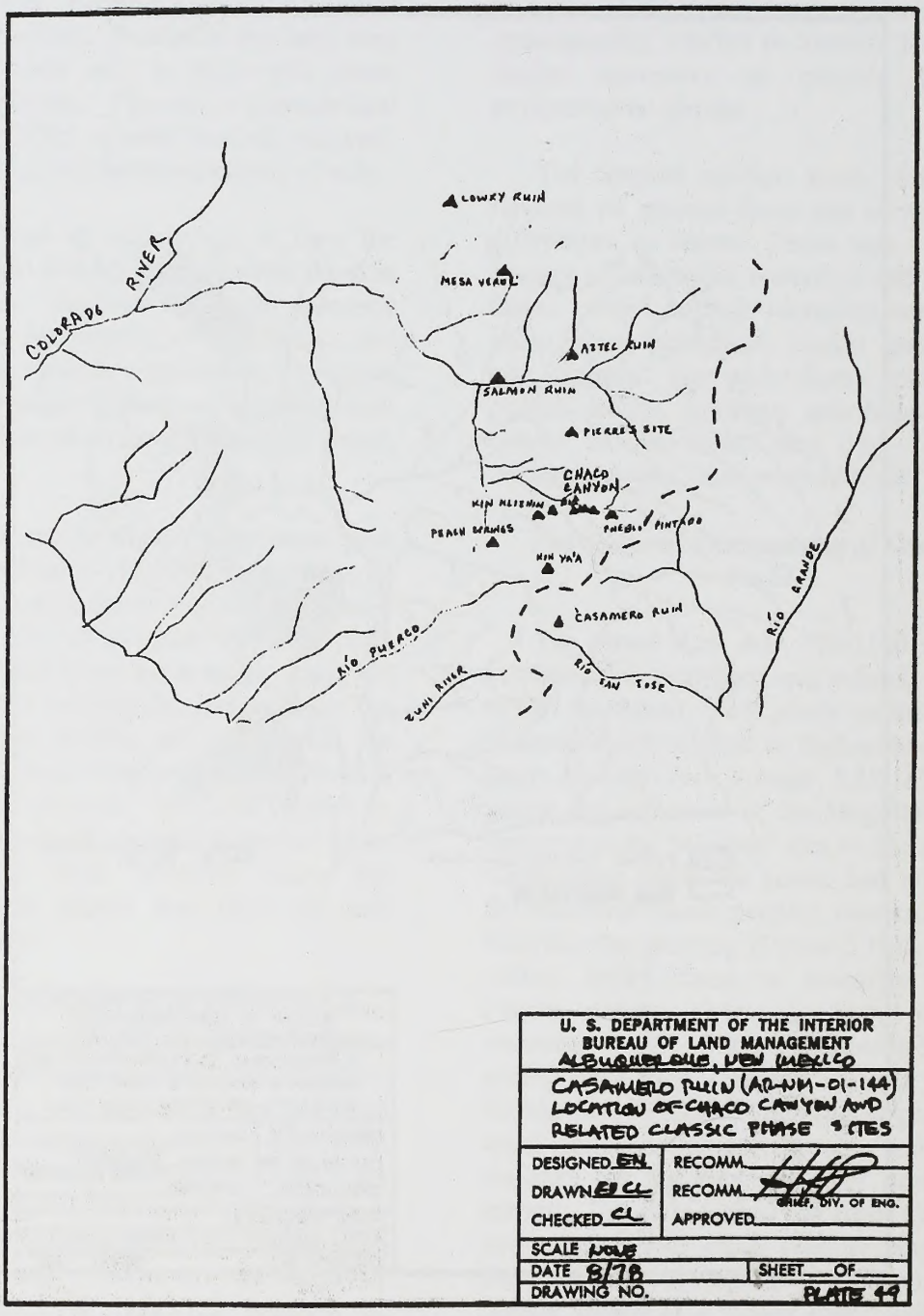


Figure 5.10. Map locating Chaco Canyon and related Classic Phase sites. (From Lester and Neller 1978.)

phenomenon. Some people think a powerful city-state developed, indigenous to the Chaco Canyon area, which dominated the politics, economics, and religious beliefs of the Colorado Plateau (e.g., Altschul 1978). Some people think that Toltecs from Mexico invaded the area and are responsible for the cultural changes that took place (e.g., DiPeso 1974; Kelley and Kelley 1975). Some people think both events occurred and reinforced each other. The debate goes on.

Casamero Pueblo was built in an area that was inhabited by both Mogollon and Ancestral Pueblo peoples. The Museum of New Mexico conducted an intensive site survey in the general vicinity of Casamero Pueblo, accompanied by the excavation of 28 sites (Smith 1964). Their unpublished report indicates that the sites in the region were highly variable. Some people were living in pithouses. The pithouses were built with remarkably little variation, having prepared floors, firepits, deflectors, and sipapus. Most of the people lived in small 1- to 4-room pueblos, built of roughly rectangular masonry blocks and adobe, with firepits and mealing bins, but without prepared floors. An exception was Prairie Dog Pueblo (LA 6383), which was L-shaped, with 15 rooms, prepared floors, and veneered compound masonry similar to Chaco Canyon styles. We have tree-ring dates from some of the ruins (Table 5.4), and the dates suggest the beginning of settlement around A.D. 930, with the main settlement occurring from A.D. 1030-1050, coinciding with the cultural florescence in Chaco Canyon. The time of abandonment is unknown, but there is no tree-ring date later than A.D. 1050. Most likely, the periods of building and abandonment are less than 100 years apart. This conclusion is supported by the ceramic evidence and the size of the midden deposits as well.

Ceramic Analysis

Pottery has become the most valuable diagnostic artifact from archaeological sites in the Southwest–documenting culture change, trade, migration, and dates of habitation. We can do this because Ancestral Pueblo potters made their wares using clay from specific quarries, and certain pottery types were made by only a few families, or perhaps a few villages, who traded their wares to surrounding areas. Each pottery tradition is characterized by its distinctive clay pastes and tempering materials, and each generation of potters is characterized by its adherence to traditional norms while introducing its own innovations. When archaeologists classify pottery, they are trying to identify these pottery traditions and generational changes. Our evaluations are only approximate, because important distinguishing characteristics can be recognized only under the microscope. Petrographic analyses are slow; and much of the basic research remains to be done, such as identifying the traditional quarries and describing their distinctive clay pastes. However, the development of this kind of laboratory technique would substantially benefit our program. Using a hand lens, in this report I classified the pottery on the basis of gross morphological characteristics, color, surface treatment, design styles, and temper.

Two general classes of pottery were manufactured: the cooking and storage pots of everyday use, and the decorated table and ornamental vessels. It is often assumed that most of the culinary (utility) vessels on a site were made locally, because they were larger and more difficult to transport, but this is not necessarily true. Based on a petrographic analysis showing that corrugated sherds had non-local tempering materials in Chaco Canyon, Anna Shepard

Table 5.4. Tree-ring dates from the Casamero Pueblo area.

Site No.	Site Name	Provenience	Date
LA 8779	Casamero Pueblo	Room 3, burned roja	A.D. 1041 +vv
LA 6383	Prairie Dog Pueblo (15 rooms, 2 kivas, 2 pithouses)	Room 12	A.D. 1042
		Kiva	A.D. 1041
		Plaza	A.D. 1034
?	Blue Spruce Site (3 pithouses, 5 surface rooms)		A.D. 934 +vv
LA 6482	1 pithouse, 5 surface rooms	Pithouse	A.D. 1050[a]
LA 6372	6 rooms, 2 kivas		A.D. 1045?

[a] Note the latest date for the area is from a pithouse.

decided that none of the late corrugated vessels were made locally (Judd 1954:234-238). Besides, some trade goods, such as salt and talc, might be transported in large utility vessels. In Room 3 of Casamero Pueblo, excavators found a corrugated vessel filled with talc (Table 4.7 and page 51). Our ceramic study uncovered two noteworthy observations: 1) the pottery at Casamero Pueblo was made from a wide variety of pastes and tempering materials, and 2) the design styles were remarkably similar, regardless of differences in the clay body.

The ceramics indigenous to the area around Casamero Pueblo have been grouped into three distinct wares (Hargrave 1964). The dominant one is Cibola Whiteware (Tables 5.5 and 5.6). Also present is San Mateo Grayware (Table 5.7), consisting of several painted types, and Cibola Grayware, consisting of unpainted types only.

Cibola Whiteware is made up of several types of white pottery with black-painted decoration. These are included within the Puerco-Chaco Series (Table 5.6) and consist of the following:

Kiatuthlana Black-on-white	Pueblo I
Red Mesa Black-on-white	Pueblo II
Puerco Black-on-white	Pueblo I-Pueblo III
Escavada Black-on-white	Pueblo II-Pueblo III
Gallup Black-on-white	Pueblo III

The Gladwins, who described and named the types, stated:

> the attempt to define black-on-white pottery horizons in the culture of the Little Colorado creates a situation which at once invites controversy. Our definition of types has therefore purposely been vague and no attempt has been made to draw sharp lines of cleavage; on the contrary, we believe that the evolution has been gradual and continuous (Gladwin and Gladwin 1931:26).

Hawley (1936) revised and redefined the Gladwins' types in her presentation of the Chaco District types. They were also discussed and used by Mera (1934) and Colton and Hargrave (1937).

Adequate descriptions of the distinguishing characteristics of each of these types in the Puerco-Chaco Series have never appeared in print [but see more recent reports, e.g., Toll and McKenna 1997]. The points of difference between them need to be defined to provide archaeologists with a common basis for

Table 5.5. Pottery types - Cibola Whiteware - Chaco/Puerco Series.

Type	Description
Red Mesa Black-on-white	White slip, polished, mineral paint designs include nested chevron lines, solid triangles, ticked and dotted lines, scrolls, sawteeth, squiggled lines, parallel lines; various kinds of tempers and pastes, some local, some not.
Escavada Black-on-white	White slip, surfaces rough, mineral paint designs usually solid elements, but hatching may be present; various kinds of temper and paste, light gray to dark gray to brown, fine-grained to coarse, smooth to rough, well indurated to crumbly, quartz grains rounded to angular, inclusions dark to light.
Puerco Black-on-white	White slip, polished, mineral paint designs include broad lines, solids, parallel lines pendant from rim; various kinds of temper and paste, as above.
Gallup Black-on-white	White slip, polished, mineral paint designs include framed hatched lines; various kinds of temper and paste.
Chaco Black-on-white	White slip, surfaces well smoothed and polished, mineral paint designs well executed and composed, framed fine hatched lines; clay body is fine textured and well indurated.

discussion. In this report, I will try to make my pottery types as understandable as possible.

In 1964 Hargrave proposed a new series for the district around Casamero, calling it the Prewitt Series (Table 5.6):

White Mound Black-on-white	Basketmaker III-Pueblo I
Kiatuthlana Black-on-white	Pueblo I
Red Mesa Black-on-white	Pueblo II
Grants Black-on-white	Pueblo II-Pueblo III
Prewitt Black-on-white	Pueblo III

Hargrave also re-examined the Chaco Canyon Series, distinguishing between Gallup and Escavada types on the basis of finishing techniques rather than painted designs, because design style does not seem to be a reliable segregating factor. Sherds from the Casamero district, which resemble Gallup Black-on-white (named Prewitt Black-on-white), show a very close resemblance to that type in Chaco Canyon (Table 5.8; Figures 5.11 through 5.15). In fact, sherds from the Casamero district and from Chaco Canyon can be distinguished only on the basis of temper differences. This suggested to Hargrave that during the relatively short life of Prewitt Black-on-white a close contact existed between the Casamero district and Chaco Canyon. Hargrave also suggests that this close contact may have had some bearing on the abandonment of the Prewitt sites. He was looking at more than just similarities in ceramics. Numerous factors suggest the archaeology of the Casamero district is related to the archaeology of Chaco Canyon, and when the Chaco Canyon cultural complex declined, Casamero Pueblo was abandoned.

Associated with the indigenous Cibola Whiteware types (Prewitt Series), Hargrave reports and describes some indigenous black-painted gray types. The gray types are basically the same as the black-painted white types, except that the white types were made with a white wash, or slip. Hargrave thought that the omission of the kaolin slip indicates an economic problem in the area, reflecting a shortage of kaolin, because omission of the slip seems to be synchronous with an increase in the size of the jars to be painted. Omission is a general practice, sufficient for a new designation, which Hargrave calls San Mateo Grayware (Table 5.7; Figure 5.13, including:

Table 5.6. Pottery types - Cibola Whiteware - Prewitt Series (Hargrave 1964).

Grants Black-on-white	A.D. 950 to 1075 (should be later)
	Rio San Jose Valley, from the continental divide to Bluewater
	Temper:
	Bowls: 20% sherd, 8% quartz sand, 5% dark clay particles Jars: 10% sherd, 6% quartz sand, 1% dark clay particles
	Surface: light or no polish, rough surface, white slip, mineral paint
	Similar to Escavada Black-on-white
Prewitt Black-on-white	A.D. 975 to 1050 (should be later)
	Rio San Jose Valley, from Thoreau to Grants
	Temper:
	Bowls: 20% sherd, 8% quartz sand, 5% dark clay particles Jars: 10% sherd, 6% quartz sand, 1% dark clay particles
	Surface: semi-polished, smooth surface, white slip, mineral paint designs
	Similar to Gallup Black-on-white

Table 5.7. Pottery types - San Mateo Grayware - Prewitt District (Hargrave 1964).

Dates	A.D. 950 to 1050 (should be later)
Place	Rio San Jose Valley
Temper	white angular sherds quartz sand grains black clay fragments
Surface	light polish, no white slip, mineral paint designs
Similarities	Bluewater Black-on-gray, similar to Red Mesa Black-on-white Las Tusas Black-on-gray, similar to Escavada Black-on-white San Jose Black-on-gray, similar to Gallup Black-on-white

Table 5.8. Comparison of designs and wares.

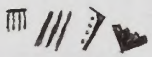
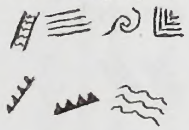
	Chaco Series	Prewitt Series	San Mateo Grayware	Redwares		
	Mineral Paint			Carbon Paint	Mineral Paint	Carbon Paint
	White Slip		No Slip	White Slip		Red Slip
Surface/designs	Temper: Sherd/sand	Temper: Sherd, sand, dark clay particles		Polished		
Surface polished A.D. 1050 to 1125	Chaco B/w paste-fine textured well indurated					
Surface polished A.D. 1000 to 1125	Gallup B/w	Prewitt B/w	San Jose B/g	Dogozshi B/w		Wingate B/r
Surface rough A.D. 1030 to 1175	Escavada B/w	Grants B/w	Las Tusas B/g	Sosi B/w		Puerco B/r
Surface light polish  A.D. 875 to 1130	Puerco B/w	Puerco B/w		Black Mesa B/w	Bluff B/r	

Table 5.8. Continued.

	Chaco Series	Prewitt Series	San Mateo Grayware	Redwares		
	Mineral Paint			Carbon Paint	Mineral Paint	Carbon Paint
	White Slip		No Slip	White Slip		Red Slip
Surface/designs	Temper: Sherd/sand	Temper: Sherd, sand, dark clay particles		Polished		
Surface light polish	Red Mesa B/w	Red Mesa B/w	Bluewater B/g			
						
A.D. 850 to 1050						

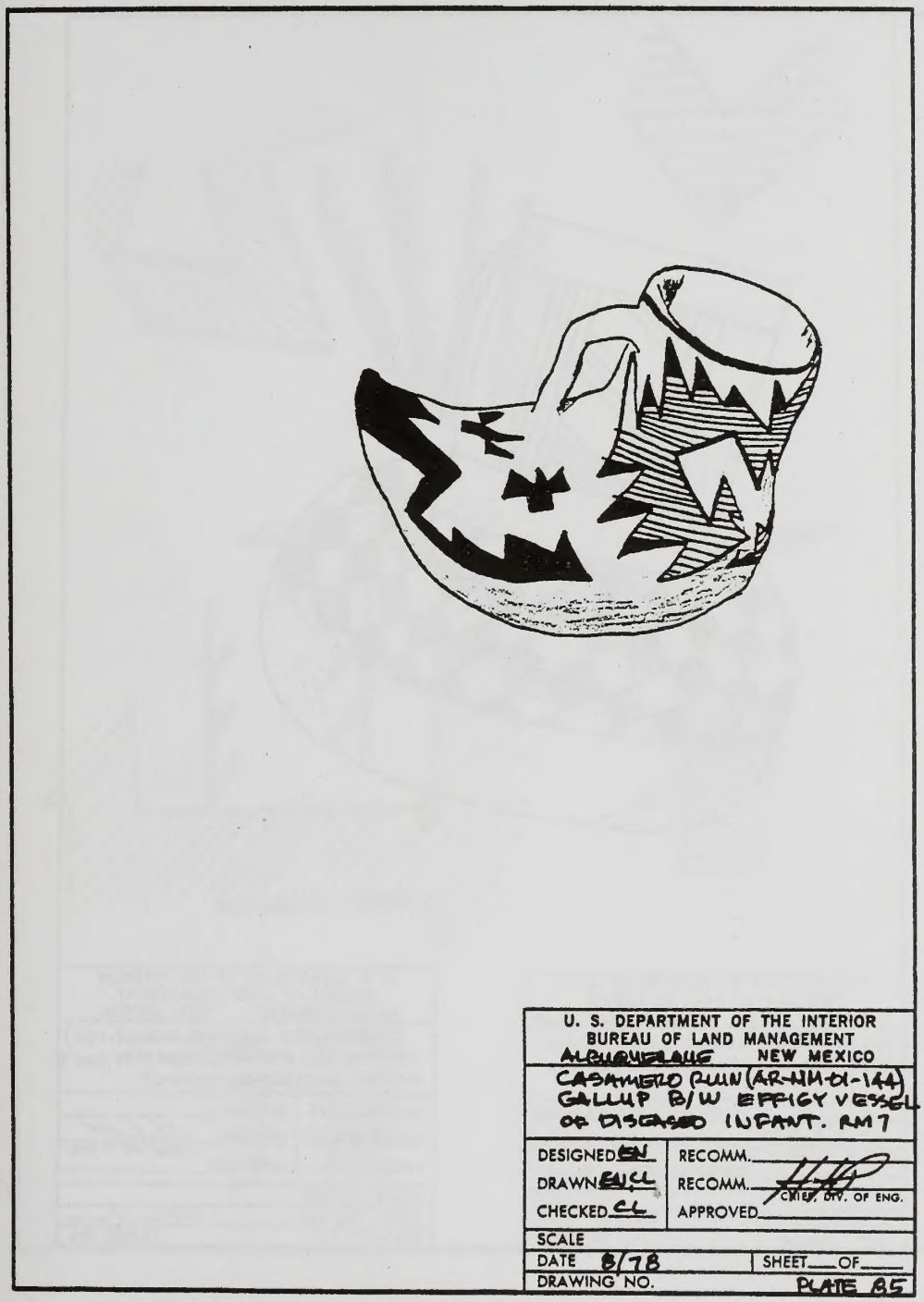


Figure 5.11a. Classic Period Gallup Black-on-white effigy vessel from cist in Room 7 at Casamero Pueblo. (From Lester and Neller 1978.)

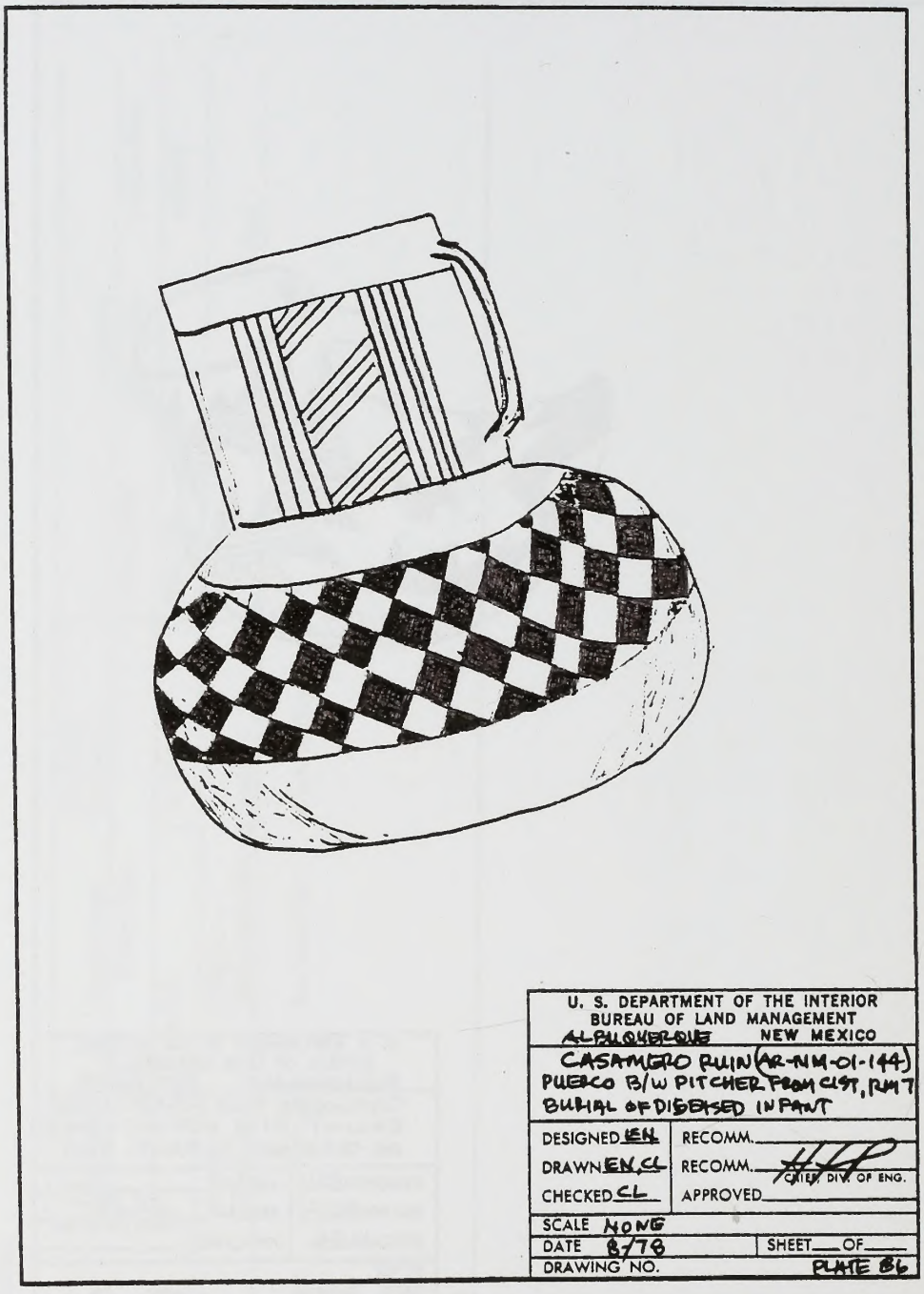


Figure 5.11b. Clasic Period Puerco Black-on-white pitcher from Room 7 at Casamero Pueblo. (From Lester and Neller 1978.)

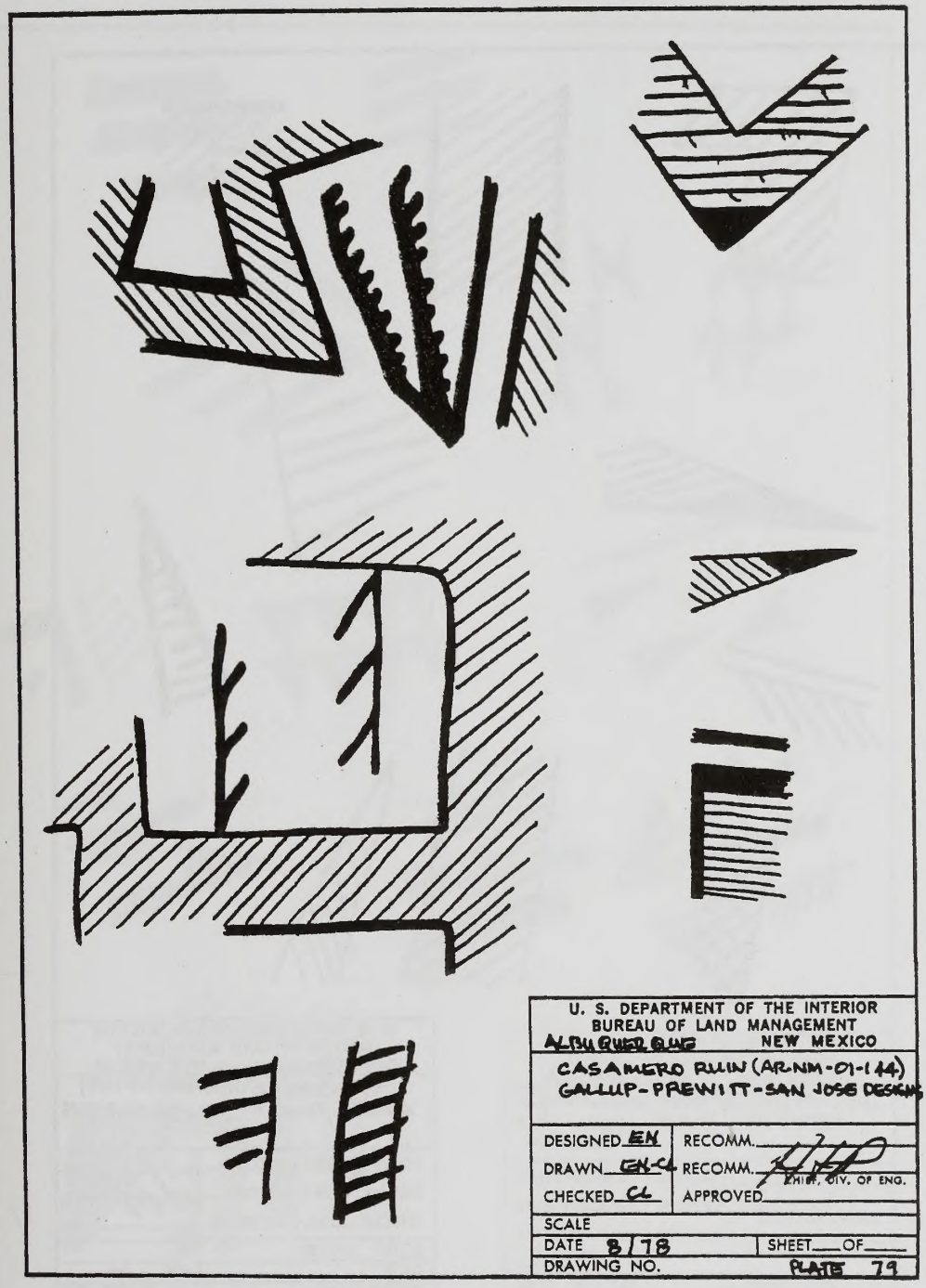


Figure 5.12a. Gallup-Prewitt-San Jose designs. (From Lester and Neller 1978.)

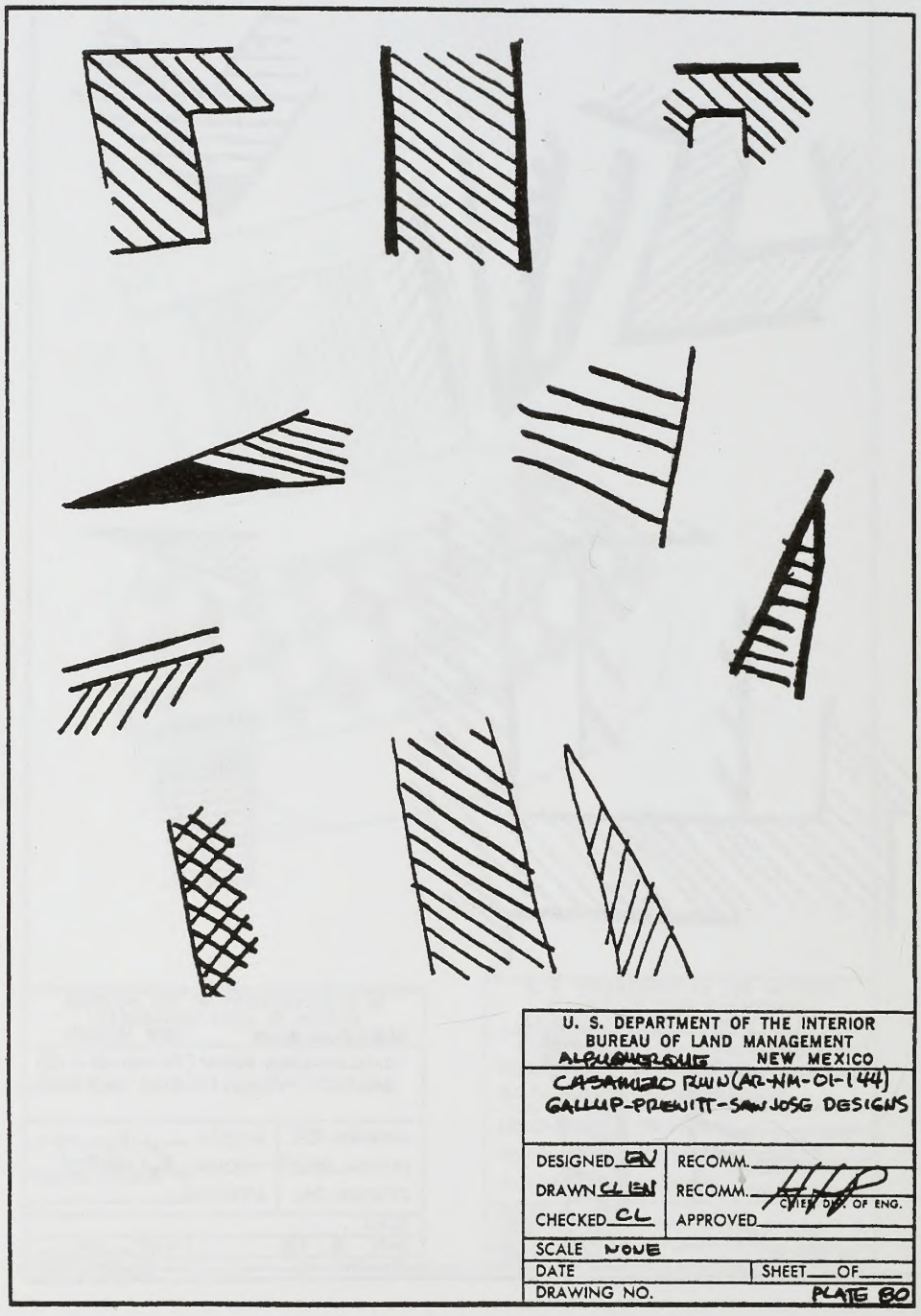


Figure 5.12b. Gallup-Prewitt-San Jose designs. (From Lester and Neller 1978.)

Figure 5.13. Escavada-Grants-Las Tusas designs. (From Lester and Neller 1978.)

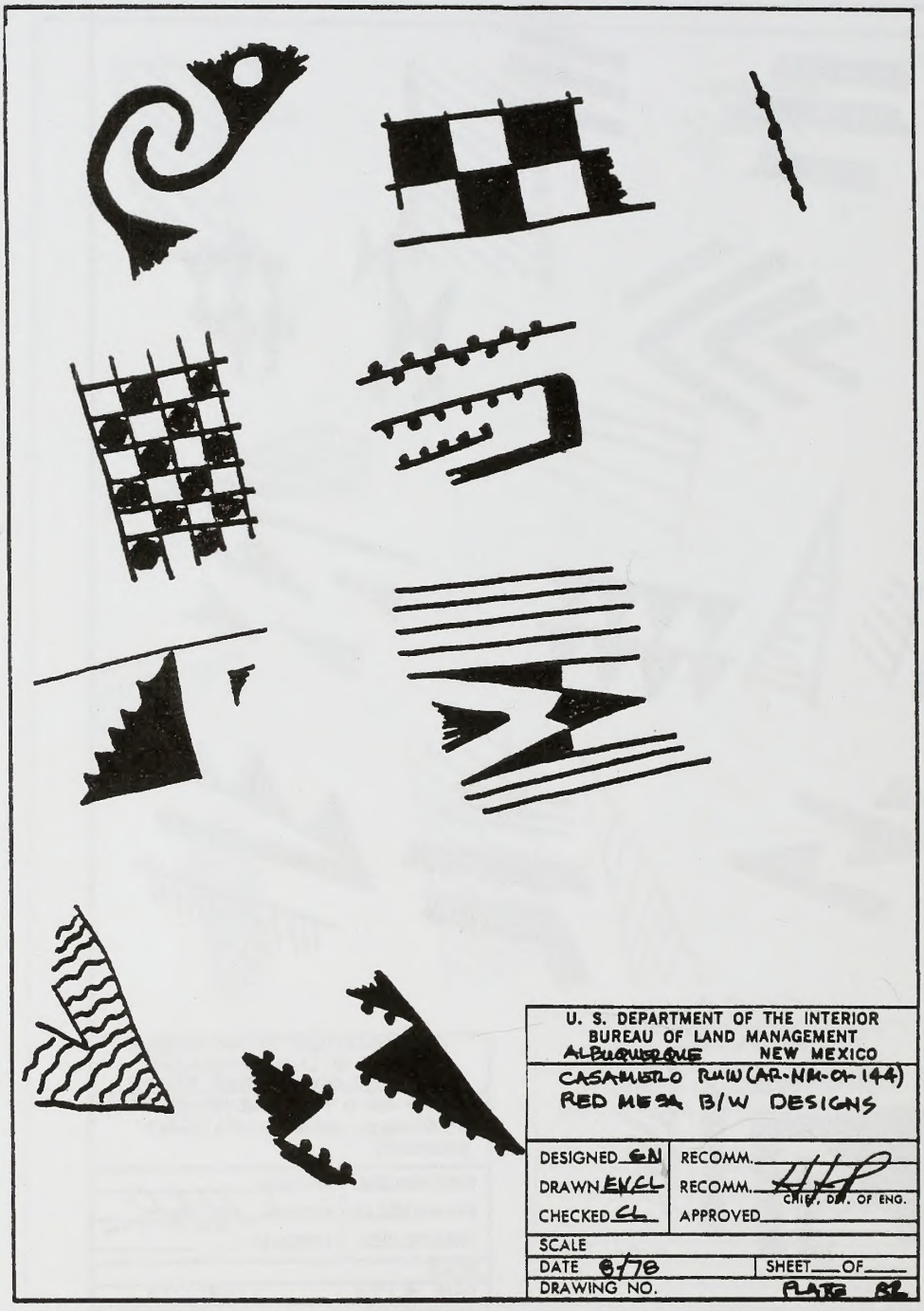


Figure 5.14. Red Mesa Black-on-white designs. (From Lester and Neller 1978.)

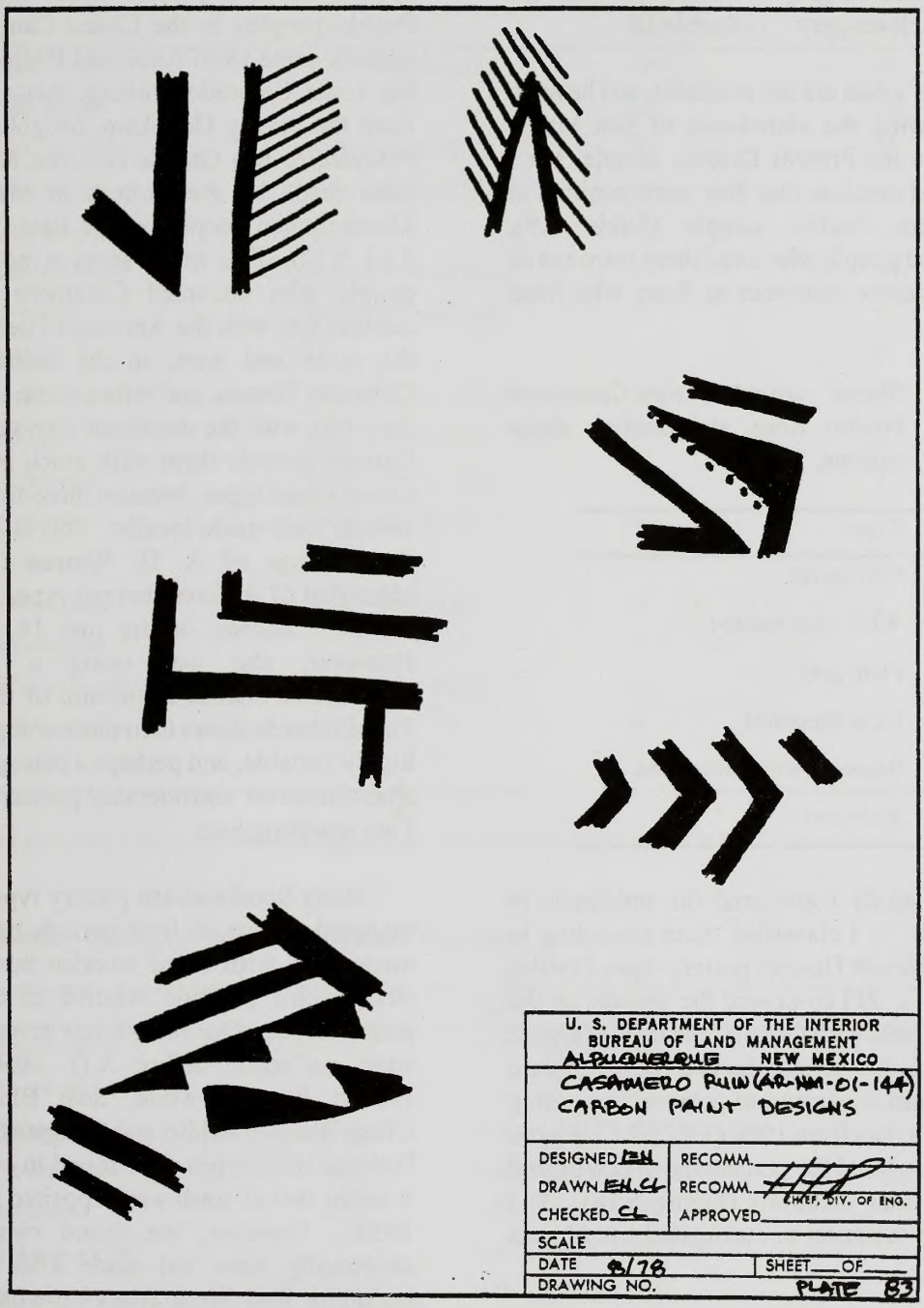


Figure 5.15. Carbon paint designs. (From Lester and Neller 1978.)

Bluewater Black-on-gray	Pueblo II
Las Tusas Black-on-gray	Pueblo II-Pueblo III
San Jose Black-on-gray	Pueblo III

Hargrave's data are not available, so I have no way of knowing the abundance of San Mateo Graywares in the Prewitt District sample, but I think I should mention that they were minimal in the Casamero Pueblo sample (Table 5.9), suggesting the people who lived there were not as deprived of scarce resources as those who lived around them.

Table 5.9. Sherd counts from Casamero Pueblo ruins stabilization excavations, 1976.

Number	Type
1,177	Corrugated
4	Wide neck-banded
75	Plain gray
276	Plain decorated
378	Black-on-white decorated
30	Redwares

For this study I analyzed the potsherds in several ways. 1) I classified them according to Hargrave's Prewitt District pottery types (Tables 5.10 and 5.11). 2) I compared the designs on the outside of vessels with those on the inside (Figure 5.16). 3) I tried to seriate the two most common decorated types according to provenience, using Anne Sigleo's data from 1966 (Table 5.12; Figure 5.17). 4) I compared the percentage of corrugated sherds in various locations (Figure 5.18). 5) I looked at the variation in corrugated vessel rims (Figure 5.19).

I sorted the sherds using established types in order to measure the magnitude of cultural relationships with other pottery-making communities and to get an idea of the time of habitation of the site. The distribution of type sources shows that 74 percent of the pottery was made locally; 6 percent came from Ancestral Pueblo peoples in the Chaco Canyon area; 20 percent came from Ancestral Pueblo peoples in the Little Colorado drainage basin; none came from the nearby Hohokam, Mogollon, Sinagua, Patayan, or Rio Grande cultures; and there was none made by the Toltecs in Mexico or the Mississippian peoples in the East (Tables 5.10, 5.11, 5.12). This would seem to indicate that the people who occupied Casamero Pueblo had cultural ties with the Ancestral Pueblo people to the north and west, in the drainages of the Colorado Plateau, and with no one else. Nor did their ties with the dominant city-state in Chaco Canyon provide them with much in the way of exotic vessel types, because three-fourths of their vessels were made locally. This is in contrast to the findings of A. H. Warren (1976), who identified 27 different temper types at Kin Ya'a, another Chacoan outlier just 18 miles away. However, she was using a petrographic microscope. Gross inspection of the Casamero Pueblo sherds shows their paste composition to be highly variable, and perhaps a petrographic study would uncover considerably greater variety than I am reporting here.

Many Southwestern pottery types have been assigned to various time periods based on their association with dated wooden beams, or their stratigraphic position relative to other, dated, pottery types. Our sample has several types that were not made before A.D. 1050, including Prewitt Black-on-white, Sosi Black-on-white, Chaco Black-on-white, and Wingate Black-on-red. Because these types were found in every deposit, it seems that no trash was deposited prior to A.D. 1050. However, we found two types that supposedly were not made after A.D. 1050, including Red Mesa Black-on-white and Bluff Black-on-red. The Red Mesa sherds are abundant and do not seem to come from an earlier occupation because of their stratigraphic contexts. From an evolutionary perspective, marginal areas, such as the Casamero region, retain anachronistic

Table 5.10. Decorated pottery types from Casamero Pueblo.

Type	Dates	No. of sherds	Percentage
Prewitt Black-on-white	A.D. 1040 to 1150	160	39
Grants Black-on-white		66	16
Red Mesa Black-on-white	A.D. 850 to 1050[a]	55	13
Puerco Black-on-white	A.D. 1000 to 1100	35	9
Las Tusas Black-on-gray		15	4
Escavada Black-on-white	A.D. 970 to 1130+	12	3
Sosi Black-on-white	A.D. 1075 to 1200	11	3
Woodruff Smudged		11	3
Gallup Black-on-white	A.D. 1000 to 1125	10	2
Bluff Black-on-red	A.D. 850 to 1000	7	2
Wingate Black-on-red	A.D. 1050 to 1200	5	1
Puerco Black-on-red	A.D. 1030 to 1175	6	1
La Plata Black-on-gray		4	1
Chaco Black-on-white	A.D. 1050-1125	3	1
San Jose Black-on-gray		3	1
Black Mesa Black-on-white	A.D. 875 to 1130	2	-
Dogozshi Black-on-white		2	-
Woodruff Brown		1	-

[a] Casamero data indicates Pueblo I-Pueblo II designs survive considerably longer in the Casamero area.

Table 5.11. Pottery types not found at Casamero Pueblo.

Type	Dates
Wupatki Black-on-white	A.D. 1200 to 1300
Tusayan Black-on-white	A.D. 1200 to 1300
St. Johns Polychrome	A.D. 1175 to 1300
Santa Fe Black-on-white	A.D. 1200 to 1350
Kayenta Polychrome	A.D. 1200 to 1300
Betatakin Black-on-white	A.D. 1200 to 1300
Gila White-on-red	A.D. 1200 to 1400
Kiet Siel Polychrome	A.D. 1200 to 1300
Kowina Black-on-white	A.D. 1200 to 1400
Mesa Verde Black-on-white	A.D. 1200 to 1300
Pinto Polychrome	A.D. 1200 to 1250

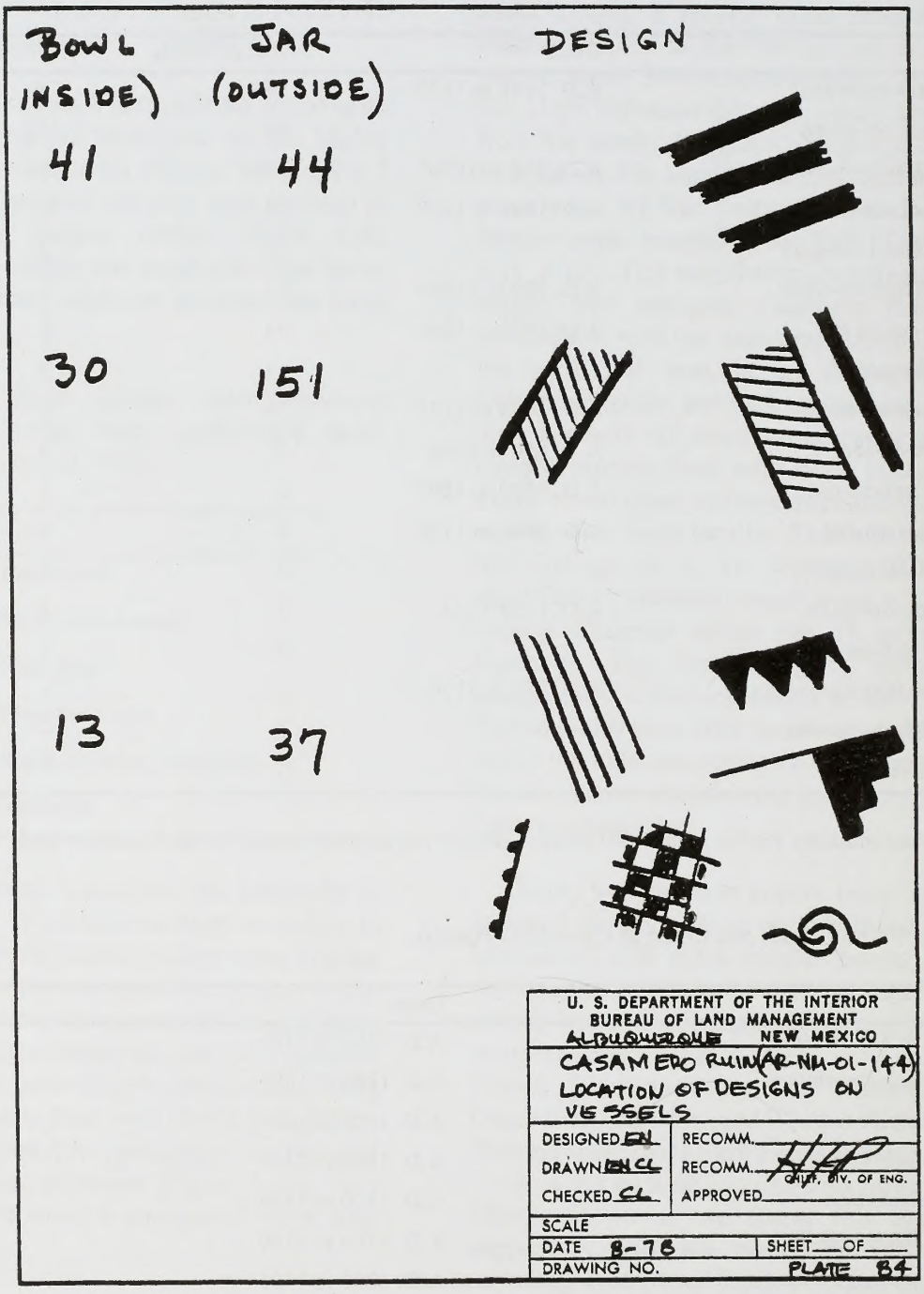


Figure 5.16. Location of designs on vessels. (From Lester and Neller 1978.)

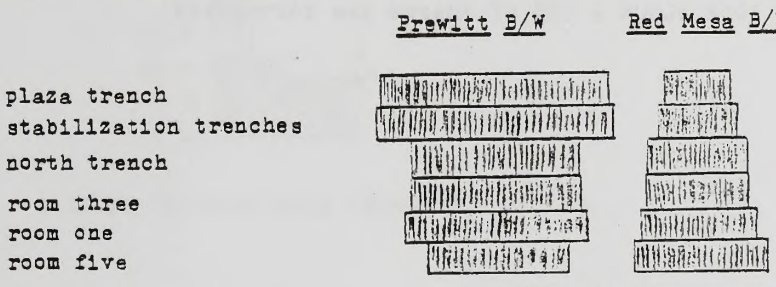
FREQUENCIES OF MOST COMMON POTTERY TYPES (based on Sigleo, 1966).

provenience

	Red Mesa B/W	Prewitt B/W	Escavada B/W	Grants B/W
plaza trench	10	35	4	2
stabilization trenches	55	160	12	66
north trench	5	9	3	0
room 3	18	30	11	1
room 1	76	121	17	6
room 5	16	17	6	1

(This comparison suggests that room deposits have a slightly higher percentage of the earlier style designs than the fill outside of the rooms, though the difference is slight.)

RELATIVE PERCENTAGES OF THE MOST COMMON POTTERY TYPES.



= 10% of the common decorated sherds.

U. S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
ALBUQUERQUE NEW MEXICO

CASAMERO PUEB (AR-NM-01-144)
FREQUENCES OF MOST COMMON POTTERY TYPES (SIGLEO 1966)

DESIGNED SN | RECOMM.
DRAWN SN CL | RECOMM. CHIEF, DIV. OF ENG.
CHECKED CL | APPROVED
SCALE
DATE 8/78 | SHEET OF
DRAWING NO. PLATE 87

Figure 5.17. Relative percentages of most common pottery types. (From Lester and Neller 1978.)

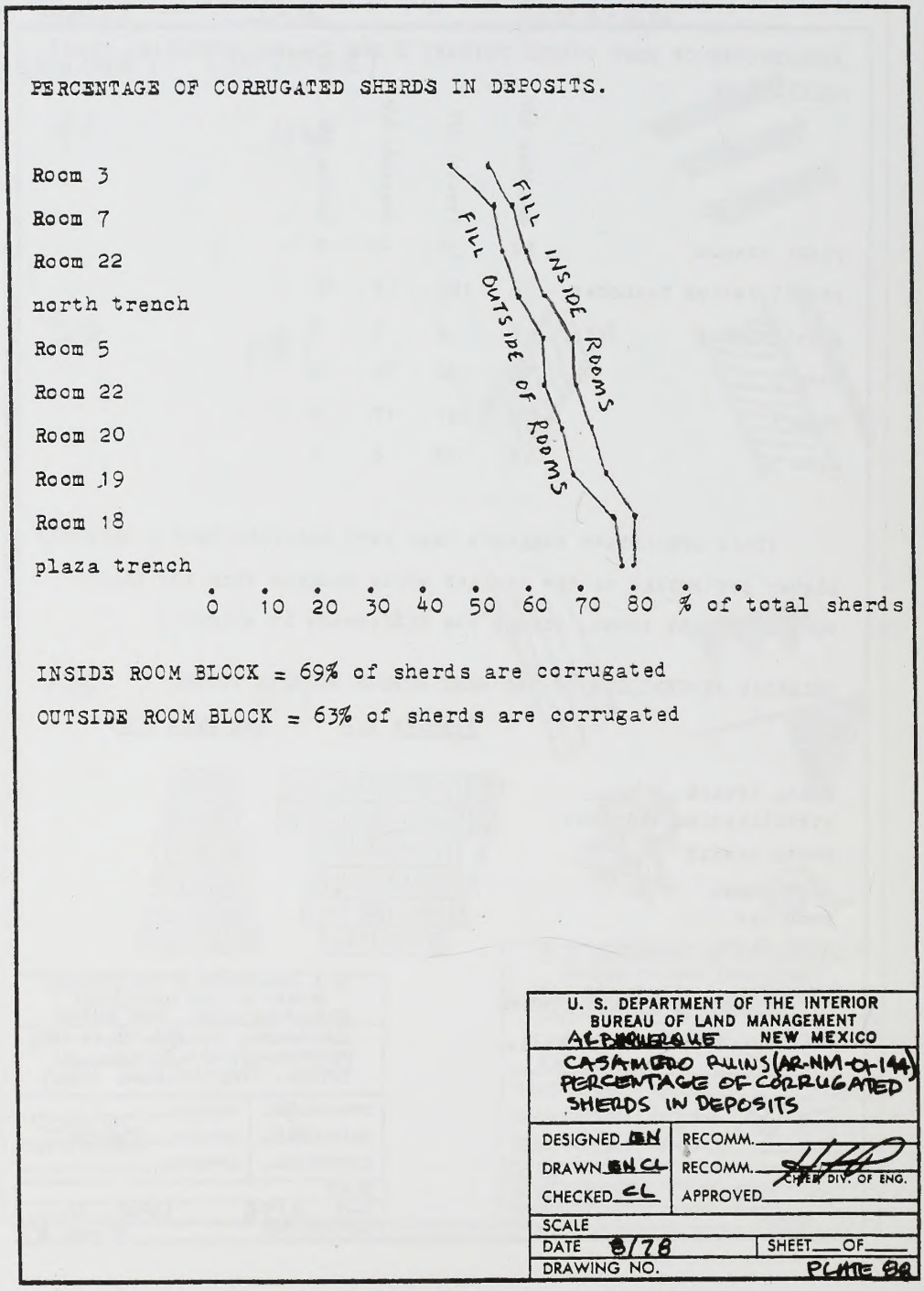
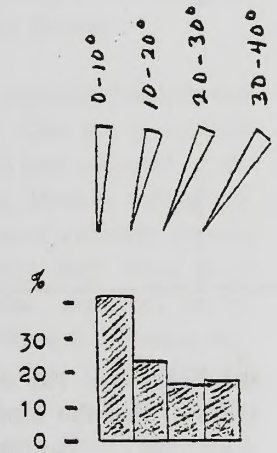


Figure 5.18. Percentage of corrugated sherds in deposits. (From Lester and Neller 1978.)

ANGLE MEASUREMENTS ON CORRUGATED VESSEL RIMS.

angle	number of rim sherds
0-10°	27
10-20°	15
20-30°	11
30-40°	12



A STUDY OF CORRUGATED VESSEL RIM ANGLES.

U. S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
ALBUQUERQUE NEW MEXICO

CASAMERO RUINS (AR-NM-01-144)
ANGLE MEASUREMENTS ON
CORRUGATED VESSEL RIMS

DESIGNED EU | RECOMM.
DRAWN EU CL | RECOMM. CHIEF, DIV. OF ENG.
CHECKED CL | APPROVED
SCALE
DATE 8/78 | SHEET ___ OF ___
DRAWING NO. PLATE 89

Figure 5.19. Angle measurements on corrugated vessel rims. (From Lester and Neller 1978.)

Table 5.12. Percentage of Casamero sherds from different sources.

Area	Type	Percentage
Local	Prewitt Black-on-white	39
	Grants Black-on-white	16
	Red Mesa Black-on-white	13
	Las Tusas Black-on-gray	4
	San Jose Black-on-gray	1
	La Plata Black-on-gray	1
East	None	
South	None	
North	Escavada Black-on-white	3
	Gallup Black-on-white	2
	Chaco Black-on-white	1
West	Puerco Black-on-white	9
	Sosi Black-on-white	3
	Woodruff Brown	3
	Wingate Black-on-red	2
	Puerco Black-on-red	1
	Bluff Black-on-red	2

features long after their disappearance from the dominant cultural pattern, and it would not be surprising if Red Mesa pottery designs persisted much longer in the Casamero region than they did in Chaco Canyon or other parts of the San Juan drainage. As a matter of fact, this is what we would expect. So, our dating of Red Mesa Black-on-white may be wrong. Perhaps some of the sherds came from heirlooms. The exact end of the occupation is difficult to determine, though we found no pottery types that began being made after A.D. 1175. Thus, our pottery data alone would indicate the site was occupied from no earlier than A.D. 1050 to no later than A.D. 1175.

We have one tree-ring date of A.D. 1041+vv from a charred roof beam from Room 8 in Casamero Pueblo. This means the outermost countable ring was grown in A.D. 1041, but how many additional rings were grown before the beam was cut is unknown. What we do know is that the roof beam was not cut before A.D. 1041. So the roof in Room 8 was constructed sometime after A.D. 1041, and this supports our estimated habitation dates based on pottery types. However, the ceramic data from Casamero Pueblo also suggests that not only do our Ancestral Pueblo pottery types need clarification and better definition, but their dating needs to be revised.

In another study, I compared the kinds of designs with their use on the interior and exterior of vessels (Figure 5.16), hoping to find a pattern which I could relate to other cultural variables. This is not a very scientific approach, but I did it anyway. I found a pattern: three-fourths of Red Mesa designs were on the exterior, five-sixths of Gallup designs were on the exterior, while Sosi designs were found in equal amounts on both the exterior and interior

of vessels. I do not have the foggiest idea what this pattern means. (That's what I get for being non-scientific!)

Overall, our sample contained 19 percent identifiable decorated black-on-white sherds. If we add to this the unidentifiable black-on-white sherds (plain, with white slip, polished) and the redwares, we find that the non-culinary sherds constitute 35 percent of our sample. This is a high percentage. In one study of 33 Pueblo II sites in northern Arizona, the average amount of decorated pottery was 7 percent (McGregor 1965). In Anne Sigleo's paper on the 1966 excavations at Casamero Pueblo, she reported 19 to 23 percent non-culinary sherds.

Our high proportion of decorated sherds can be attributed to two factors. One has to do with the processes of pottery use and disposal. I do not know if an Ancestral Pueblo household normally would have had more culinary vessels to begin with, but certainly they were used more, and took more abuse, and had to be replaced more often than decorated wares, and they were larger and broke into more pieces. Thus, corrugated sherds accumulated in the trash dumps at a faster rate than decorated sherds. At Casamero Pueblo some of the rooms were used as trash dumps, and consequently the sherd proportions from those rooms reflect the higher discard rate of corrugated sherds. Our sample comes from outside the room block, and therefore more likely approximates the relative proportions of decorated and culinary vessels the people had at the time the site was abandoned. This conclusion, that the proportion of culinary sherds coming from the fill inside the rooms is greater than the proportion of culinary sherds coming from outside the ruin (Figure 5.17) because the material in the room fill was deposited earlier, is supported by looking at the percentage of corrugated sherds from various locations and the relative percentages of Red Mesa Black-on-white sherds (early Pueblo II) versus Prewitt Black-on-white sherds (late Pueblo II). More corrugated sherds are found inside the rooms than outside. More of the early style designs are found inside the rooms than outside. It should be noted that these comparisons are based on a limited sample of the room data, because I only have the results of the first season's excavations. It should be noted, then forgotten, because the whole subject is rather trivial, although as archeologists we need to pay more attention to the process of trash accumulation and site abandonment.

Still, the percentage of decorated vessels is high and probably reflects a difference in social and economic status between the people who lived in Casamero Pueblo and those in the nearby pueblos. Many aspects of the site support this explanation: the relatively large amount of turquoise found at Casamero Pueblo (one piece of turquoise found from 28 excavations in the Prewitt District [Smith 1964] versus five pieces found at Casamero [Sigleo 1966, 1967]), the large number of decorated sherds, the large number of sherds with a white slip, the large number of rooms, the large size of some of the rooms, the sophisticated masonry used in wall construction, the large room-to-kiva ratio, and the adjacent great kiva.

Architecture

The stone walls of Casamero Pueblo look so similar to walls at Classic Period (Bonito Phase) sites in Chaco Canyon that the structure must have been built by the same group of people who built the fantastic multistory pueblos in Chaco Canyon. Casamero Pueblo is not a copy of the pueblos in Chaco. It was built for a different purpose, with different needs, but it was built by the same people, using the same techniques. (Were stone masons bona fide specialists during the Bonito Phase?) Walls are built on a carefully prepared adobe/rubble foundation. The walls themselves consist of limestone slabs, carefully quarried and shaped to produce a kind of cored, veneered masonry

which is structurally capable of supporting a great deal of weight, endures a great deal of use, abuse, weathering, and requires a great deal of labor. It is remarkable how much the limestone slabs at Casamero Pueblo resemble the sandstone slabs used to build almost all Chacoan Bonito Phase ruins.

Florence Hawley Ellis (Hawley 1938) distinguishes several masonry types in Chaco Canyon which can be identified at Casamero Pueblo, including Inferior Wide Banded with Core, Spalled Block with Core, and Fine Unbanded with Core (all A.D. 1100-1116). These three types are contemporaneous at Chetro Ketl as they are at Casamero Pueblo, and their associated construction dates imply a later construction period for Casamero Pueblo than the pottery indicates, around A.D. 1100-1116. This is the same time period that Kin Ya'a was built, only 18 miles away (Table 5.13). If not for the Red Mesa Black-on-white, this would be a reasonable construction date for Casamero Pueblo. We should keep in mind that dating based on pottery types is an approximation at best, while dating based on masonry styles is equally hazy. The cultural correlates of masonry styles have not been identified; and different styles may reflect different stone masons, ethnic groups, sandstone sources, time period preferences, or the perceptual bias of modern observers (who are archaeologists).

Aside from the structure of the stone walls, other architectural features are the same as those in Chaco Canyon. I checked the linear dimensions of Casamero Pueblo and found that the floor plan could have been established using a standard length of 1.66 feet, or 19.92 inches (Table 5.14). Apparently the architect(s) and builders of Casamero Pueblo had some kind of Ancestral Pueblo "yardstick" to help them during construction. Dee Hudson (1972) studied standards of measurement in Chaco Canyon, isolating several standardized units,

Table 5.13. Construction dates for Bonito Phase sites (Hayes 1975).

Date (A.D.)[a]	Site
1025	Pueblo Bonito
	Chetro Ketl
	Talus Unit
1035	
1045	Casa Rinconada
	Hungo Pavi
1055	Una Vida
	Pueblo Pintado
	Peñasco Blanco
	Casa Chiquita
	Pueblo del Arroyo
	Casamero Ruinh?
1065	
1075	Kin Kletso
	Chimney Rock
1085	Kin Klizhin
	Salmon Ruins
1105	Kin Ya'a
	Wijiji
	Aztec Ruin
	Tsin Kletzin
1115	Kin Bineola

[a] For more current dating see Lekson (1984) and Windes and Ford (1992, 1996).

including one for the west plaza of Pueblo Bonito ,which was 19.91 inches, identical to Casamero Pueblo's standard. As Hudson's study isolated several measurement standards, this similarity implies close cultural ties between the people who built Casamero Pueblo and the people who built parts of the west plaza at Pueblo Bonito, assuming more than coincidence is involved.

Table 5.14. Room measurements taken from map and corresponding multiples of the hypothesized Ancestral Pueblo measurement standard.

Ancestral Pueblo standard	English Equivalent (feet)	Measurements taken from wall lengths (room widths) at Casamero Ruin
X	1.66	
5X	8.3	8.5, 8.5, 8.5
6X	9.96	10.2, 10.5, 10.5, 10.0, 10.0, 10.0, 10.0, 10.2
7X	11.62	11.5, 11.8, 11.5, 11.8
9X	14.94	15.5, 15.0
10X	16.6	16.2, 16.5, 16.2, 17.0
11X	18.26	18.2, 18.0
12X	19.92	

Usually Pueblo II ruins (Hosta Butte Phase sites in Chaco Canyon) consist of southeast facing rows of rooms, a kiva, and a trash mound. At Bonito Phase sites, a plaza area enclosed by stone walls or rooms was also built. Casamero Pueblo has an enclosed plaza like the Bonito Phase sites in Chaco Canyon.

Normal Hosta Butte Phase pueblos average 6.5 rooms per kiva. Bonito Phase pueblos average 30 rooms per kiva. Casamero Pueblo has approximately 28 rooms and one kiva.

Bonito Phase kivas have low benches running around the wall; these are thought to be used to support the roof. Casamero Pueblo has such a kiva bench.

Bonito Phase sites include elaborate ceremonial structures, like the isolated great kiva at Casa Rinconada. Other isolated great kivas are near Peñasco Blanco, Marcia's Rincon, Shabik'eshchee Village, and Kin Ya'a. Casamero Pueblo is 245 feet from an isolated great kiva. The authenticity of Casamero Pueblo's great kiva has been the subject of debate. Some archaeologists think it is a stock pond (see discussion in Marshall et al. 1979: 134); yet: 1) A fence runs through the middle of it, unlike a stock pond. 2) It is a perfect circle, unlike a stock pond. 3) Its perimeter is raised all the way around, unlike a stock pond. 4) It is not built across a drainage and has no watershed, unlike a stock pond. 5) It has no cattle trail leading up to it, nor did it ever have one, unlike a stock pond. 6) It normally does not have standing water. These are the characteristics that suggest it is great kiva: 1) It is the right size. 2) It is a perfect circle. 3) It is associated with a Chacoan outlier. 4) It is similar to large depressions associated with other Ancestral Pueblo sites in the Malpais area. "Stone circles" are associated with great kivas in Chaco Canyon. None have been found near Casamero Pueblo, but the mesa overlooking the site, where such a "stone circle" would be found, has suffered extensive quarrying damage.

Bonito Phase sites are connected by *roads*. Such a road has not been found at Casamero Pueblo; however, our modern day dirt road follows the only route available for such a

Table 5.15. Estimates of the labor required to build Ancestral Pueblo sites in the Casamero region (in person days).[a]

Rooms	Area (m^2)	Walls (m)	Masonry (p/d)	Roof (p/d)	Adobe (p/d)	Total (p/d)
23 + Great kiva	600	213	226	120	60	406
17	258	170	111	52	26	189
4	16	24	16	3.2	1.6	20.8
3	12	20	13	2.4	1.2	16.6
3 + 2 pithouses	36	60	39	7.2	3.6	49.8
2	8	14	9	1.6	0.8	11.4
2	8	14	9	1.6	0.8	11.4
7	28	42	28	5.6	2.8	36.4
5	20	15	12.5	4	2	18.5
4	16	24	16	3.2	1.6	20.8
8	32.2	44	30	6.4	3.3	39.6
5 + 1 pithouse	32	35	25.5	6.4	3.2	35.1
4	16	24	16	3.2	1.6	20.8
8	32	44	30	6.4	3.2	39.6
6	24	34	23	4.8	2.4	30.2
8	32	44	30	6.4	3.2	39.6
2	8	14	9	1.6	0.8	11.4
8	32	44	30	6.4	3.2	39.6
6	24	34	23	4.8	2.4	30.2
2	8	14	9	1.6	0.8	11.4
2	8	14	9	1.6	9.8	11.4

[a] Sites documented by Smith (1964).

prehistoric road. [More recent research (Nials et al. 1983; Vivian 1990; Winter, Chapter 9) indicate a road links Casamero with the Andrews site across the wash to the east.]

Every prehistoric structure can be described according to the amount of energy required for its construction. This energy requirement can be used as a measure of social status. It is easy to see that Casamero Pueblo represents much more labor than other nearby sites from the same period. Just for purposes of comparison, I made some estimates of the labor involved in construction and the differences between the local sites (Table 5.15). Let us say one man can build a wall one story high, two meters long, in

one day. Then, for veneered masonry, add one day for every 1 m^2 of floor space to collect and prepare the shaped masonry slabs. For crude rubble and adobe construction, estimate one-fourth day per 10 m^2 of floor space to collect the masonry blocks. Add two days for every 10 m^2 to collect roofing materials and actual roof construction. Add one day per ten square meters for collection, preparation, and application of adobe. These are highly arbitrary figures, but if they are applied evenly to all sites, then the results will give a fair estimate of the "relative differences" in the labor required to build the different sites (Figure 5.20). My figures suggest it would take a family one week to build a three room pueblo, which is too short a time. They also show, however, that it would take 25 times the labor (required for a one family pueblo) to build a site like Casamero Pueblo.

Jonathan Reyman (1971) has shown that some early Pueblo architectural features reflect sophisticated astronomical knowledge. In ecological terms, such knowledge has adaptive significance for agricultural peoples in the Colorado Plateau. Because the growing season is short, the time for spring planting needs to be known to the nearest week to avoid excessive crop failures. I have not been able to determine whether Casamero Pueblo has any intentional astronomical orientations (Table 5.16). The pueblo as a whole has a southeastern exposure, like Hosta Butte Phase sites and unlike many Bonito Phase ruins. However, the eastern and western halves of Casamero Pueblo have slightly different orientations, further confusing the picture.

Many of the walls in the eastern part of the pueblo, including kiva walls, were constructed using shaped sandstone slabs as well as limestone. Why? Is this related to the slightly different orientation of the eastern half? Two ventilator shafts were found during stabilization, suggesting the kiva we see may have been remodeled and may have had a different orientation originally. Why? A blocked tunnel seems to lead off from the kiva to Room 17. Why? I do not have any answers, but I have a feeling these architectural features are important clues to Ancestral Pueblo culture as practiced at Casamero Pueblo.

In terms of stabilization management it is quite clear from this study of architectural features at Casamero Pueblo that stabilization is an archaeological function, regardless of the amount of excavation involved. The information gained during stabilization could also be lost, especially when laborers are neither aware of the scientific implications of ruin features nor care about them. Of course, we could take a few photos, look the other way, and say "let somebody else worry about that;" but that is what we call "apathetic archaeology," and I prefer to think of myself as a professional.

Lithic Analysis

I studied the chipped stone from the stabilization excavations using the material source codes provided by A.H. Warren of the Chaco Center (Table 5.17). Four functional types of stone tools were obtained during stabilization:

29 unmodified flakes
2 flake scrapers
1 core
6 hammerstones

Although our sample is small, apparently most of the stone tools were made using stone from local sources. The total absence of knives, drills and points is puzzling as is the absence of debitage associated with stone tool making. Perhaps such items would be found if excavations were conducted in areas away from the walls of the ruin. The results of our excavations at pueblo ruins may be skewed by the apparent wealth of sherds and other artifacts close to

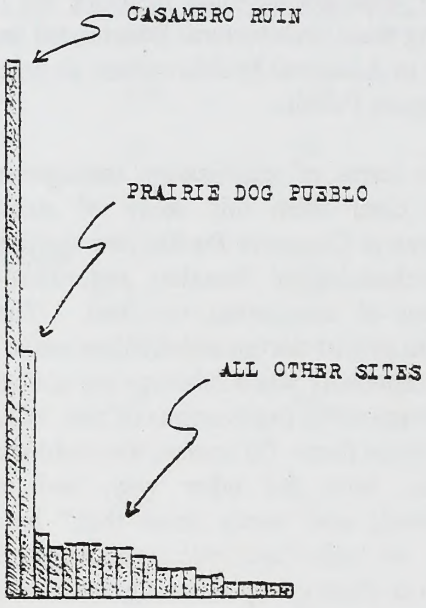


Figure 5.20. Comparison of labor to build sites in the Casamero region measured in person/day estimates. (From Lester and Neller 1978.)

stone walls and trash dumps. Certain kinds of activities, such as stone tool making, may have been conducted apart from the abode of the elite, perhaps near the planting areas, or next to a mesa top shine. Such sites may not leave much to see on the surface and might even be overlooked during routine surface survey.

Human Ecology at Casamero Pueblo

Ecology is the study of the relationships between living organisms and their environment. In order to understand the system operating at Casamero we need to review the data from the Prewitt salvage excavations (Smith 1964) because the people who lived in those ruins were an important part of the local ecosystem.

Table 5.16. Casamero Pueblo orientations.

Provenience	Orientations
Kiva	340°/160°
Kiva niche	41°/221°
Walls (west room block)	41°/221°-131°/311°
Walls (east room block)	318°-325°-46°

Ceramic analysis suggests the area was occupied for a short time, from A.D. 950 to 1050. The early Pueblo II dating was probably based on an abundance of Red Mesa Black-on-white, and it seems to be too early considering the tree-ring dates. A.D. 1050 to 1150 is probably a closer approximation of the habitation period.

The sites were on low ridges overlooking the valleys, between the woods and the fields. Settlements were small, consisting of masonry pueblos with one to four rooms. A few sites were larger, with over seven rooms and a kiva. Walls were built of roughly rectangular sandstone and mud. Only three of the sites had masonry comparable to Bonito Phase sites: Prairie Dog Pueblo, Arroyo Chico Site, and Lobo Mesa Site. Prairie Dog Pueblo was the only site with prepared floors. These tiny pueblos did not conform to any particular stylistic pattern.

In contrast, the area also had people living in pithouses that closely conformed to a particular pattern. They all had prepared floors, deflectors, firepits, and sipapus. As the latest tree-ring date from the area at A.D. 1050 came from a pithouse at LA 6482, we know the two kinds of housing were contemporary. The dichotomy implies that two ethnic groups were in the area, one highly variable and the other uniformly clinging to tradition. In either case the people seemed to be farmers.

Table 5.17. Chipped stone source materials recovered during stabilization.

No.	Material	Warren's Code
1	obsidian, black, opaque, dull surface, probably from Grants Ridge area	3510
2	obsidian, black, opaque, waxy luster, glossy sheen, probably from Red Hill area	3550
16	chert, yellow brown to red, with abundant black, mossy inclusions, probably from southern Zuni Mountains near Ramah, or local limestones; also found in Tertiary gravels in the Jemez Mountains	1072
9	chert, mainly white, mottled or banded, with grays and pinks, dull luster, probably from Red Mesa Valley, also found in Four Corners area, and Colorado	1040
1	chert, red, jasper, waxy luster, from various locations	1060
1	silicified wood, light colors, white, yellow, brown, gray, dull luster, fractures in splinters, various locations	1110
2	silicified wood, dark gray with light streaks, waxy luster, found in Menefee Formation, Nacimiento Formation, others	1112
1	silicified wood, white, banded, waxy luster, conchoidal fracture, found in Nacimiento Formation gravels, other locations	1113
2	quartzite cobbles, pink, gray, coarse-grained, found in various locations	4005
3	limestone, fine-grained, gray, banded, Todilto Formation, Prewitt	?

Ecological variables include population size and its relationship to critical resources. How many people lived at Casamero Pueblo? The size of the pueblo is related to the number of inhabitants, although the range of variation is considerable. Historic pueblos average 1.9 people per rooms (Pierson 1949). Using this figure, Casamero Pueblo housed 50 people. However, if we make an adjustment to compensate for the high room/kiva ratio at Bonito Phase sites like Casamero Pueblo, and try the estimate of 12 people per kiva (based on the Hosta Butte Phase ratio), we would guess that Casamero Pueblo was the dwelling of 12 people, perhaps one family and their servants. The idea that Pueblo II kivas belong to family groups, rather than kinship groups such as clans, needs to be tested, but certainly fits well with the pattern in Chaco Canyon. If Casamero Pueblo were the home of one family, they lived in luxury compared to the surrounding people who lived in 1- to 4-room pueblos and pithouses. The people at Casamero Pueblo had more space, more rooms, better walls, and they did not have to walk as far to get to the great kiva. Clearly, they were the local elite, probably politically as well as economically. Their association with the great kiva implies they were the religious leaders as well. The merchant class concept in Chaco Canyon archaeology does not apply to the pattern at Casamero Pueblo, unless we can show that the great kiva had significance as a market center rather than a religious center. Of course, a great kiva would have been an ideal place for collecting religious tribute, as the Spanish cathedrals were several centuries later. The plaza area would have been more appropriate for market trading.

Based on population density, habitation in permanent dwellings, and the corn and squash in trash middens, we know the local people were agriculturalists. How intensively they farmed the area we do not know, but some degree of resource deterioration and depletion probably occurred because the land today is more suitable for grazing than farming. The period of occupation does not seem to have been long, and abandonment was probably caused by some deviation in the cultural climate rather than devastation of the natural environment. We have no evidence at Casamero Pueblo for new buildings or roof repairs before A.D. 1030 or after 1050. The artifact collections from the Prewitt salvage project point to no particular regional specialization that might have made the area uniquely important to the Chaco Canyon system (Smith 1964). Is the number of hammerstones or palettes significant? This should be one of the questions addressed in future research in the area because I am certain the area was locked into the Chacoan system, as indicated by the rapid pace of settlement and abandonment.

Other questions about human ecology cannot be answered by our data. How can we describe the Ancestral Pueblo diet? What was the relative importance of corn, squash, rabbits, and turkeys, all found at Casamero Pueblo? Flotation analysis of midden samples might help answer this question.

Did local farmers irrigate their fields? What size were local Ancestral Pueblo fields? Our reconnaissance of the area failed to locate field boundaries or remnants of irrigation systems. Unless Ancestral Pueblo fields are covered with silt, or totally eroded away, aerial photographs might help. It is also possible that fields with regular boundaries and irrigation ditches were not part of the system.

These questions are intimately related to any study of ecological relationships and need to be answered before we can understand the human ecology of the area.

Discussion and Conclusions

Traditional archaeology is the art of excavation and interpretation of artifacts and might be analogous to the "worm's eye view." Such a view is appropriate and sufficient for annelids. Scientific archaeology is akin to the science of anthropology, the study of culture, and might be likened to the "bird's eye view." In order to understand the remains at Casamero Pueblo, we have to study the site with regard to its external relationships, both with respect to its place in a local community and with respect to its place in a regional society (Smith 1976). We have data on the local community provided by the Prewitt highway salvage study (Smith 1964), and data on the regional pattern provided by the numerous Chaco Canyon oriented studies.

In the Casamero community we do not see a pattern of cultural evolution from campsite to pithouse to scattered pueblos to towns. Rather, cultural development begins and ends with scattered pueblos. We see a frontier community flourishing on the boundary of a prosperous society, and (presumably) dying when the capital of the nation died. We see a cultural adaptation that could not survive in terms of a few scattered pueblos. We are looking at an integrated community and a regional society, and the people needed each other as much as they needed the resources provided by the natural environment. When something in Chaco Canyon died, so did Casamero. Technologically, I think we can say the area had the resource base to support small family farms longer than it did.

While on the one hand the cultural pattern of a local community cannot be explained without reference to the regional system, on the other hand the social organization found in a small community can be seen as a microcosm of

the dominant regional hierarchy. In the Casamero community we see a hierarchy in housing, religious structures, turquoise jewelry, and ceramic resources (no shortage of white-slipped sherds at Casamero Pueblo). Social stratification implies differential control over wealth and resources. Scarce resources help to structure the system. Control of religious authority can be just as effective as controlling water in the desert. Religious authority, political power, and wealth have been synonymous throughout human history. The presence of a great kiva at Casamero Pueblo implies that religious authority was a factor in the local hierarchy. It need not have been a factor at every outlier, but its importance at Casamero Pueblo would imply a similar hierarchy existed at the center of power, Chaco Canyon.

Cultural systems strive for stability, and a system of inequality is stabilized when the elite's control of wealth and resources is institutionalized. Control of religion is one way of doing this. Religious institutions usually perpetuate tradition, including political power. Power, not morality, is usually the motivating force.

In terms of resource allocation and distribution, the Casamero community was probably directly responsive to the needs of the elite in Chaco Canyon, not the local population. In fact, settlement in the area was probably initiated by demands created in Chaco Canyon. Marginal areas are often peopled by younger brothers of dominant families. Settling and farming virgin lands would have been a way for powerful families in Chaco Canyon to increase their wealth, and as we all know, "no matter how wealthy, it's never enough." Besides, when overpopulation begins to overtax the local Chaco Canyon resource base, powerful families would have had to colonize outlying areas just to maintain the status quo. The economic basis for colonization does not preclude the missionary flavor such an expansion probably had. In the Casamero community, it would appear that settlers from Chaco Canyon took control of an area already sparsely settled by people living in pithouses. Unable to leave their homes, they lived side by side with the vassals of the Chacoan elite. The lives of the pithouse dwellers may have even improved somewhat, as the people from Chaco Canyon may have had advanced technological know-how on any number of things, like when to plant in the spring to avoid crop failures, how to select seed to get a good crop next year, and which plant best relieves the symptoms of arthritis. The Casamero community probably provided a wealthy Chaco Canyon family with staples that were becoming hard to get close to home: corn, beans, squash, mountain sheep, pronghorn, firewood, and roof beams. (Remnant stands of ponderosa suggest pine forests were more extensive in the past.) Local pottery styles confirm Chaco Canyon's dominance. Local designs are identical to those in Chaco, implying that local potters strived to please the demand in Chaco, rather than local preferences or the tastes of people to the west.

Class structure is usually related to ethnic boundaries. This is reinforced by human psychology, but it is perpetuated by cultural institutions such as marriage. It is not likely a woman from the Casamero Pueblo family would ever marry someone living in one of the nearby tiny pueblos or out-dated pithouses. Marriages were probably arranged to reinforce political power and economic status. Thus, class boundaries are maintained and gene pools drift apart. When the elite are few in number, inbreeding sometimes becomes a problem. One of the burials at Casamero Pueblo was the burial of "a deformed or diseased child" (Sigleo 1967). Dental characteristics show the child was 3 to 5 years old when he died. The cranium exhibits advanced symptoms of a skeletal condition known as *symmetrical osteoporosis*. Parts of the skull are bloated and porous. This condition

is thought to result from anemia caused by nutritional deficiencies, including lack of iron, vitamin B_{12}, folic acid, and protein. Many factors working together may have resulted in nutrition problems. Cooking corn and beans in water for a long time would have destroyed 90 percent of the folic acid and vitamin B_{12}. Intestinal infestations would have caused poor absorption of nutrients (Steinbeck and Thomas 1976). However, at Mesa Verde, James S. Miles (1975) noted that the disease (*symmetrical osteoporosis*) affected predominantly infants and children (who presumably had the same diet as adults), and that the diseased skeletons were found in clusters (three in Juniper House, two in Mug House). While he agreed that the skeletal condition was a symptom of erythroblastic anemia, he asserted the disease was hereditary. There were two infant burials in Room 7 at Casamero Pueblo; however, A. Howard Elam destroyed or kept most of the other one, and we don't know if that baby suffered from the same disease. The condition is recessive and would tend to show up more in a small endogamous population such as the Chaco aristocracy.

The cultural pattern at Casamero Pueblo neither confirms nor disproves theories about Toltec immigrants, colonists, or missionaries in Chaco Canyon. The people's remains seem to be a local variation of the contemporary Ancestral Pueblo pattern. Exotic items such as copper bells and macaws were not found at Casamero Pueblo. Someday we may discover that access to these items was not uniform throughout Chaco Canyon's elite. On the other hand, our findings suggest that class distinctions existed, and that religious authority was an important part of the social hierarchy.

CHAPTER 6

THE CASAMERO OUTLIER SURVEY[1]

Randy A. Harper and Marilyn K. Swift

Project Description

The Class III Inventory, carried out by the Office of Contract Archeology of the University of New Mexico, was designed to complete and report on an intensive inventory of the archaeological sites in the 160 acre federal parcel containing the Casamero Pueblo and its community (Figure 6.1). All identified sites were recorded on Laboratory of Anthropology forms, and a Class III Inventory Report was prepared (Harper et al. 1988). Because many of these sites had been recorded previously, we attempted to update the site forms when possible, but when there were inconsistencies or differences of opinion among recorders, we included the different versions.

Documentation of artifacts and features was designed to collect a standardized set of data to provide a comparative database with other Chacoan sites in the San Juan Basin, specifically on the Pierre's parcel, which was surveyed under the same contract (Harper et al. 1988). As specified in the guidelines, in-field identification of ceramic artifacts was conducted according to traditional ceramic typologies. Vessel form was also noted. Lithic raw materials were coded according to the numerical designations developed by Helene Warren (1967). Room count estimates were recorded for each structural site and architectural details were noted on the site sketch map. The specific methodology employed for the collection of these data is described below.

The field personnel for the Casamero community survey were Peter Arena (mapping), James Brandi (lithics), Barbara Mills (ceramics), and Randy Harper (site forms), with additional help by Joseph Winter during the initial walkover survey.

Research Orientation

The research orientation of this project was directed towards providing an inventory of the parcels specified in the task scope and documentation of cultural finds to provide a comparative database with other research conducted in the San Juan Basin, particularly with respect to the Chaco Phenomenon. We therefore intended to document the following: 1) the chronologic/cultural sequence for the sites recorded, 2) the spatial array of sites by land form, 3) exchange patterns as demonstrated by analysis of the lithic materials and ceramic types, and 4) range in variability in Navajo site type.

The documentation of the chronologic and cultural sequence was largely based on the results of the ceramic analysis which is presented in Chapter 7. Other sites, including aceramic lithic scatters and Navajo sites, were documented on the basis of temporally sensitive artifacts and/or architectural styles. Artifacts, architectural styles, and site layout were also used to analyze the range in variability in Navajo sites.

Other research has documented the association of Chaco sites within specific

[1] This chapter initially appeared as parts of Chapters 3, 4, and 5 in Harper et al. (1988).

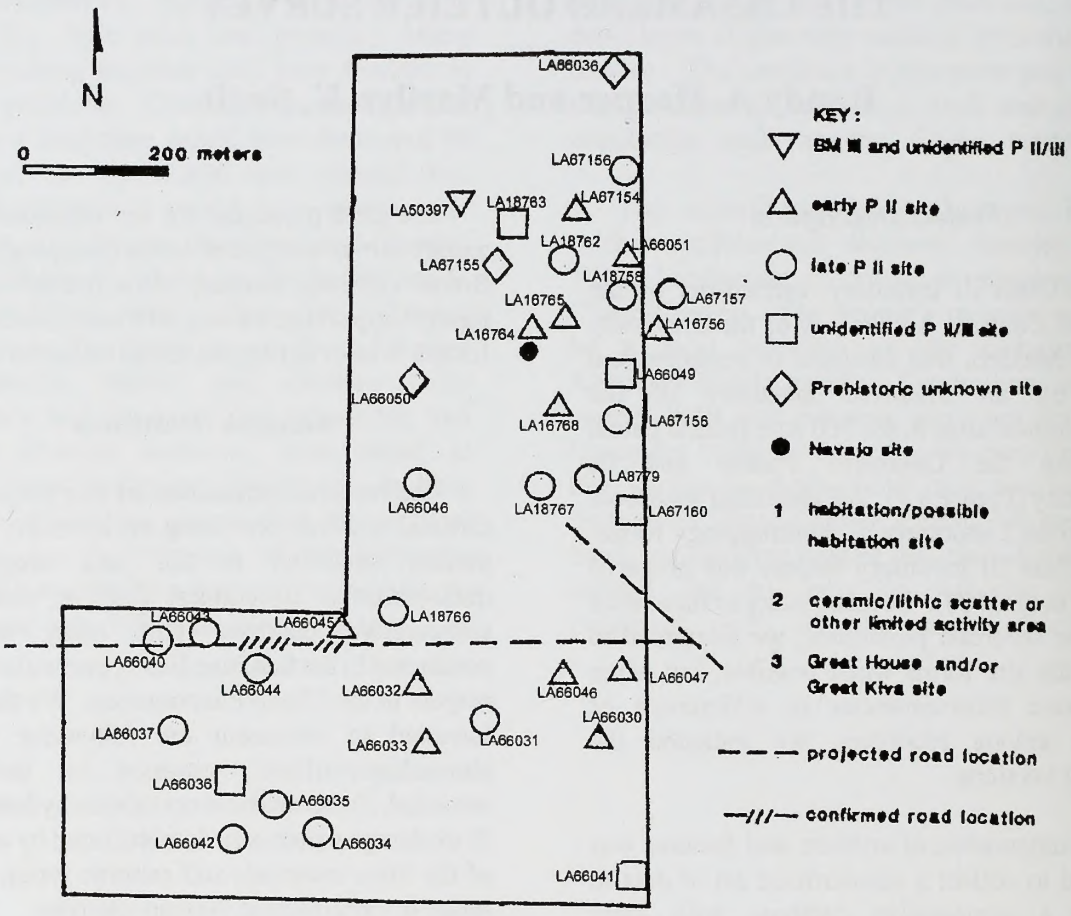


Figure 6.1. Site locations within the Casamero parcel. (Adapted from Harper et al. 1988:Figure 4.1.)

environmental zones. Sites within survey parcels were plotted on a topographic map and discussed with respect to their physiographic location.

Exchange patterns may be documented across time and space if source-specific lithic materials and ceramic types and tempers are taken into account. The material types found on aceramic lithic scatters were compared to those associated with ceramic artifacts to determine if correlations can be stated. Another set of parameters was considered for the Chaco community sites. Results of a study conducted by Jacobson (1984) suggest that within each district of the San Juan Basin, preference for or use of local materials is consistent between villages and towns in that each district appears to have relative frequencies for material types that are unique from other areas. Jacobson's study suggests that outliers were not actively involved in exchange of lithic materials. Other studies conducted by Cameron (19840 suggest a temporally specific influx of Narbona

(Washington) Pass chert into Chaco Canyon from A.D. 1050 to 1100. This material was, however, noticeable absent from surrounding outliers. While the occurrence of Narbona (Washington) Pass chert in Chaco Canyon demonstrates an exchange pattern, the absence of this material in the outliers negates a redistribution system (Cameron 1984:150). Material indexes figured from the present analysis were compared to these findings.

In a similar manner, analysis of source-specific temper types has documented a large influx of Chuskan ceramics into Chaco Canyon during the same temporal period. Toll (1984:132) suggests that, in the absence of similar percentage frequencies of Chuskan ceramics at outliers, these data lend credence to the seasonal influx of people and pots to Chaco Canyon. The ceramic analysis discusses the role of local and imported or nonlocal types in the ceramic assemblages of the Casamero Community and Pierre's Community.

Survey Methods

The survey methods were designed to insure that a Class III inventory of the Casamero parcel was conducted. This parcel contains relatively steep to moderate terrains so a tight and even transect spacing was necessary at all times. As defined by the Bureau of Land Management-Farmington Resource Area, transect intervals of 15 meters or less were required. This was accomplished in the field by lining up crew members in a straight line. A distance of 15 meters was paced between each survey member. On the first transect, the "boundary" surveyor would follow an exact straight line (usually by compass or boundary fence), while the other surveyors would maintain the 15 meter intervals, as paced from the boundary surveyor. Pinflags were laid out at varying intervals to define the outer line of each transect. On the next transect these flags were picked up in a zig-zag fashion, thus insuring that the transects kept on a line and no areas were missed.

The plan was to walk over the entire parcel area first in order to identify all cultural materials encountered. At this time the resources were to be minimally described and marked on a USGS map for future location. The advantage of walking over and defining the cultural resources first without recording is that the total number and types of sites is known at the completion of the walkover. This enables the field crew to plan strategies for recording the sites and to take advantage of time and expertise.

With the completion of the walkover, site recording was initiated. Upon arrival at a site all artifacts (if feasible) were pinflagged. Different colors were employed to denote lithics from ceramics as applicable. These activities defined the site area, demonstrated artifact types, and revealed artifact concentrations and features (if present). Crew members were specialized in their respective tasks to maintain consistency in recording. Each site was recorded on the Laboratory of Anthropology site survey form.

Quantitative data on ceramics (types and bowl vs. jar ratios) and lithic raw materials and types were obtained for each site. These were based on a minimum count of 50 to 100 sherds and 50 to 100 lithics if possible. Three sample approaches were used to accomplish this:

Total samples: All artifacts at sites with less than 100 lithics and/or 100 ceramics were recorded, using pinflags.

Flag samples: For sites with more than 100 ceramics and/or lithics, and which lacked discrete concentrations, a systematic approach was used. For example, if it was estimated that there are 200 ceramics, then every other one was pinflagged and recorded. "Rare items" were also recorded.

Discrete samples: When sites contained several discrete concentrations and/or other features, each discrete area was sampled, using flag samples or quadrats, depending on the nature

of the provenience. The sample size of each provenience never dropped below 15 ceramics/20 lithics, unless there were fewer artifacts than that in the provenience.

The overall aim of this approach was to obtain data on at least 50 to 100 lithics and/or 50 to 100 ceramics at each site (if those numbers of each are contained in the site), for statistically valid comparisons. No artifact collections were taken during the course of the survey. In addition, room counts (estimates), detailed sketch maps (with sample artifact loci), and photos were also made/taken. The sites were located on USGS maps demarcating artifact extent and site stakes (rebar with stamped aluminum caps denoting site number) were placed and tied into the sketch map. All isolated occurrences (I.O.) were recorded in the field and located on USGS maps. Table 6.1 provides the descriptions of the I.O.'s for the Casamero parcel.

Discrepancy Identification and Problem Resolution

Prior to the onset of the field phase of the present survey, archaeological site forms curated by the Bureau of Land Management and a site-specific data printout from the Archaeological Records Management System (ARMS) were procured for all recorded sites within the boundaries of the survey parcel. While comparability was achieved in most instances between data recorded during previous surveys and that recorded during the present survey, several discrepancies were noted. The most common discrepancies involved differences in site location. Upon verification of compatible descriptive information, the present survey was able to provide more accurate locational data. This updated information is included on the site forms.

For example, this survey plotted a location for LA 18763 different from an earlier survey. Comparison of the site descriptions verified that only the locational information was in question. The present locational information is believed to be the most accurate.

Other discrepancies resulted when this survey could not relocate sites LA 18757 and LA 18769. LA 18757 was described by the ARMS file as a masonry room block, midden, and ceramic scatter. We recorded another site, LA 66049, in a location similar to that for LA 18757. However, the description of LA 66049 as a ceramic and lithic scatter does not match that for LA 18757. It therefore appears that they are not the same site, but it is possible that the alluvial character of the geomorpholocial setting at LA 66049 may have obscured the site.

A similar situation may exist for LA 18769. The Office of Contract Archeology survey was also unable to relocate this site; it is possible that sediments have accumulated over the top of the site or that it was inaccurately located during the original survey and instead lies outside of the present Bureau of Land Management boundary near the intersection of the Borrego Pass road and a west tending two-track road. We did record a number of isolates in this general location, but we did not consider them a site.

Table 6.2 presents concordance lists of all site numbers for the parcel. It also lists the above problems. Most of the problems which occurred during the survey appear to be the result of inaccurate plotting of site locations. These inevitable result from the archaeological practice of "eyeballing" or "pacing off" of site locations. To insure the most precise location information and to finally resolve discrepancies between various surveys, it is recommended that the site locations be plotted by professional land surveyors.

Chronological/Cultural Sequence

During the course of the inventory, a total of 39 sites were found within the Casamero parcel.

Table 6.1. Isolated occurrences within the Casamero parcel.

I.O. #	Description	I.O. #	Description
1	(3) Cibola Whiteware unidentified, bowl, body sherds	22	Irregular core, limestone
2	Cibola Whiteware unidentified, jar sherd	23	Unidentified Grayware sherd
3	Kiatuthlanna B/w, bowl sherd	24	(2) Cibola Grayware, jar sherds
4	Early Red Mesa B/w, jar sherd		
5	Plain Gray, jar sherd	25	Gallup B/w, bowl sherd
6	Cibola Grayware, Incised Corrugated, jar sherd Unidentified corrugated, jar sherd	26	Gallup B/w, bowl sherd
7	Gallup B/w, jar sherd	27	Cibola Grayware sherd
8	Gallup B/w, bowl sherd	28	Kiatuthlanna B/w, jar sherd Escavada B/w, jar sherds (2) Cibola Grayware, indented corrugated, jar sherds
9	Unidentified corrugated, jar sherd	29	Tertiary flake, Morrison chert
10	(2) Cibola Whiteware, bowl sherd	30	Red Mesa B/w, bowl sherd
11	Cibola Whiteware, bowl sherd	31	Cibola Whiteware, jar sherd
12	Cibola Whiteware, bowl sherd	32	Escavada B/w, jar sherd
13	Cibola Whiteware, bowl sherd Indented corrugated, jar sherd	33	Secondary flake, chert Unidentified Cibola Whiteware, jar sherd
14	Cibola Whiteware, bowl sherd Indented corrugated, jar sherd	34	Unidentified Cibola Grayware, jar sherd
15	Unidentified corrugated, jar sherd	35	Cibola Whiteware sherd
16	Cibola Whiteware, jar sherd	36	Cibola Whiteware, jar sherd
17	Cibola Grayware, clapboard corrugated, jar sherd	37	Cibola Whiteware sherd
18	(2) Puerco B/w, bowl sherds	38	Cibola Whiteware, jar sherd
19	Secondary flake, chert, fossiliferous Cibola Grayware, jar sherd	39	(7) Cibola Whiteware, jar sherds. Pot drop.
20	Puerco B/r, bowl sherd	40	Projectile point/biface, white chert, tip broken
21	Cibola Grayware, jar sherd		

Table 6.2 Concordance list for Casamero parcel sites.

Laboratory of Anthropology No.	Anasazi Communities No. (Marshall et al. 1979)	BLM No. (Gaudy 1984)	Smithsonian No.	OCA Temporary No. (on site stake)	Site Name; Other Comments
LA 8779			29MC0186		Casamero Pueblo
LA 18756	1				
LA 18757	2				Maybe LA 66049, but unclear
LA 18758	3				
LA 18762	7				
LA 18763	8				
LA 18764	9				
LA 18765	10				
LA 18766	11				
LA 18767	12				
LA 18768	13				
LA 18769	14				OCA could not relocate site
LA 50397					Stake erroneously has LA 66039 on it
LA 66030		2			
LA 66031		4			
LA 66032		6			
LA 66033		5			
LA 66034		7			
LA 66035		9			
LA 66036					
LA 66037					
LA 66038					
LA 66039					Basketmaker site on Mesa is actually LA 50397
LA 66040				347-1	

Table 6.2 continued.

Laboratory of Anthropology No.	Anasazi Communities No. (Marshall et al. 1979)	BLM No. (Gaudy 1984)	Smithsonian No.	OCA Temporary No. (on site stake)	Site Name; Other Comments
LA 66041				347-11	
LA 66042				347-12	
LA 66043				347-18	
LA 66044		8		347-19	
LA 66045				347-20	
LA 66046		3		347-21	
LA 66047				347-23	
LA 66048				347-25	
LA 66049				347-27	
LA 66050				347-29	
LA 67151				347-35	
LA 67154				347-36	
LA 67155				347-38	
LA 67156				347-39	
LA 67157				347-40	
LA 67158				347-41	
LA 67159				347-42	
LA 67160				347-43	

Detailed site summaries for each site are given in Harper et al. (1988:Appendix 1A, while Appendices 2, 2A, and 2B provide detailed ceramic data and Appendix 3 provides detailed lithic data).

Different criteria were used in defining the temporal periods of the various sites. If the sites contained ceramics, then a temporal mean date was derived after the in-field analysis (refer to Chapter 7 for details). If no ceramics were found but lithics were present, then the lithics were analyzed in comparison with those at ceramic sites to determine if differences could be discerned. Due to this analysis, some aceramic sites were assigned to the Archaic period, but some caution must be taken until these sites have been physically dated (if possible). Finally, if no ceramics, lithics, or other artifacts were found in association with the site (e.g., wood in historic

sites or the erosional state of the prehistoric sites)–in short, a subjective "guess" date was estimated and must be taken as such. Given the above criteria and the data in the appendices in Harper et al. (1988), a summary of the sites' temporal periods is presented below.

Table 6.3 shows the chronological and cultural sequences for the Casamero parcel sites. The earliest site found within the 160-acre parcel area of the Casamero community was associated with the Basketmaker III period (A.D. 450-750). This lone habitation site equals 2 percent of the Casamero site total and is located on top of Tecolote Mesa.

The next temporal period represented in the parcel is the Early Pueblo II. A total of 12 sites (31 percent) dates to this period between A.D. 920-1020 (refer to Chapter 7, Table 7.4, for the ceramic phases and associated sytlistic types for the Pueblo II and the subsequent temporal periods). Of these, eight are habitation, two are middens (possible habitations), and two are ceramic and lithic scatters. The Late Pueblo II period is next represented, dating to A.D. 1020 to 1120. A total of 17 sites (40 percent) was assigned to this period; included are one great house with an associated great kiva (Casamero Pueblo), one other possible great kiva, nine habitation sites, and two possible habitations, an activity area, and three ceramic and lithic scatters. A possible Chaco road was also identified in association with one of the habitation sites (see Chapter 9 for discussion). Because of overlapping of ceramic types, a separate category was needed and labeled unidentified Pueblo II/III. This spans a period from A.D. 920 to 1220. Five sites (13 percent) fall into this category and consist of one habitation and four ceramic and lithic scatters. Finally, three sites (8 percent) are assigned to the prehistoric period; because they lack associated datable artifacts, they are called prehistoric unknown. A granary (Figure 6.2), a rock art panel, and a series of hand-and-toe holds (Figure 6.3) are represented. All are probably of Ancestral Pueblo origin.

For the historic period, the Casamero parcel contains only three sites (8 percent): a probable Navajo corral dating to the late nineteenth century (dating based on the degree of deterioration so it is subjective), and two other sites of unknown cultural affiliation. These consist of a wind break of unknown age located within a rock shelter, and a post-1920 temporary camp. Both represent components that are part of other sites. The remains of a post-1960 dugout where a pothunter stayed were noted but not recorded.

The Spatial Array of Sites by Land Form

After plotting the located sites on a USGS topographic map of the area , four environmental zones within the Casamero parcel were defined as follows: 1) mesa top, 2) slickrock face, 3) talus slopes, and 4) valley bottom. It was hoped that some patterning would become apparent in relation to a specific temporal period. This might indicate a preference for a particular area for farming during say the Early Pueblo II period or, perhaps, a preference for a particular landform or orientation. Unfortunately, no patterns could be clearly discerned, except for the general absence of sites on the mesa top and talus slopes. A breakdown of the area by sites into environmental zones is as follows:

Mesa top

Only one Basketmaker III/Unidentified Pueblo II/III site was found on the mesa top, which might indicate either a preference during the Basketmaker III period, or it may be a result of valley bottom sediment accumulation obscuring earlier components in the lower areas. Interpretation is problematic because a large percentage of the mesa top has been surface scraped in conjunction with twentieth century uranium exploration. The Pueblo II-III

Table 6.3. Temporal periods for the Casamero parcel.

	Temporal Periods						
Site No.	Basketmaker III	Early Pueblo II	Late Pueblo II	Unidentified Pueblo II/III	Prehistoric Unknown	Navajo	Historic Unknown
LA 8779			x				
LA 18756		x					
LA 18758			x				
LA 18762			x				
LA 18763				x			x
LA 18764		x					
LA 18765		x					
LA 18766		x					
LA 18767			x				
LA 18768			x				
LA 50397	x			x			
LA 66030		x					
LA 66031			x				
LA 66032		x					
LA 66033		x					
LA 66034			x				
LA 66035			x				
LA 66036				x			
LA 66037			x				
LA 66038					x		x
LA 66040			x				

Table 6.3. Continued.

	Temporal Periods						
Site No.	Basketmaker III	Early Pueblo II	Late Pueblo II	Unidentified Pueblo II/III	Prehistoric Unknown	Navajo	Historic Unknown
LA 66041				x			
LA 66042			x				
LA 66043			x				
LA 66044			x				
LA 66045		x					
LA 66046		x					
LA 66047		x					
LA 66048			x				
LA 66049				x			
LA 66050					x		
LA 66051		x					
LA 67154		x					
LA 67155					x		
LA 67156			x				
LA 67157			x				
LA 67158			x				
LA 67159						x	
LA 67160				x			

Note: LA 66039 was the number we originally gave to LA 50397. When we discovered that the site already had an LA number, we dropped the LA 66039 designation.

Figure 6.2. Site LA 66038. Close-up of granary wall. (From Harper et al 1988:Plate 5.1.)

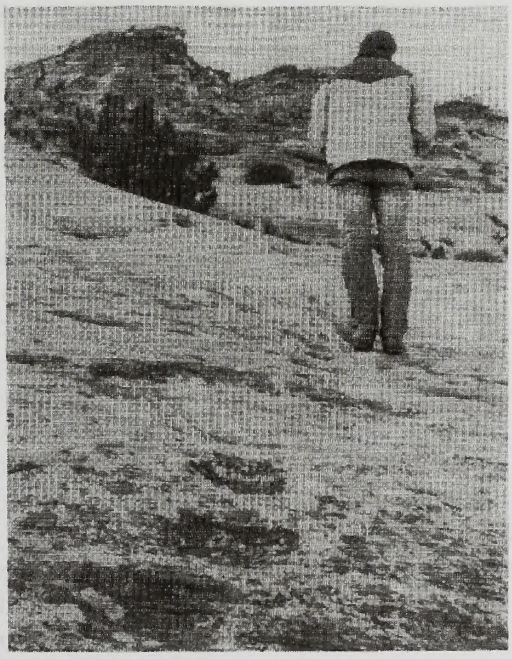


Figure 6.3. Site LA 67155. View of hand-and-toe holds looking east. (From Harper et al. 1988:Plate 5.2.)

components at the site is a room block and kiva that were probably part of the Casamero community.

Slickrock face

Four sites or 10 percent of the total were located within this zone. These consist of a rock art panel, a series of hand-and-toe holds, a rock shelter, and a granary. Unfortunately, none could be dated due to lack of associated artifacts.

Talus slope

No sites were located on this steep zone, although it was probably utilized for access to and from the mesa top.

Valley bottom

All the remaining sites (34 or 87 percent of the total) are located within this environmental zone. Every temporal period is represented with no patterning discernable.

In essence, not much can be said about the spatial distribution of sites by environmental zones within the Casamero parcel. A strong preference for the valley bottom would be expected given the moderate degree of slope and availability of nearby arable lands. The possibility of earlier components buried beneath the alluvial deposits in the valley bottom must also be considered. If present, these may yield other possible environmental zone preferences by temporal period.

Exchange Patterns as Demonstrated by Analysis of the Lithic Material and Ceramic Wares

Exchange patterns may be documented across time and space if source-specific lithic materials and ceramic types and tempers are taken into account. Certain evidence suggests that most of the exchange items were "consumed" in Chaco Canyon and were not redistributed (Cameron 1984; Powers et al. 1983). Jacobson (1984) has suggested that outliers were not actively involved in the exchange of lithic materials. The following discussion incorporates data from the lithic and ceramic analyses of this project. Chapter 9 investigates these results in detail.

Lithic Exchange Patterns

The analysis of the lithic materials from the Casamero parcel was conducted to 1) give a raw count of materials and types, 2) determine if lithic trace items (exotics) were being redistributed along known trade routes (i.e., roads), and 3) determine if there were differences in material types between aceramic and ceramic sites. The results of this analysis are presented in Chapter 8.

In summary, the lithic analysis did not reveal interaction within definite regional trade networks. Generally, the predominant materials utilized were derived locally. The inhabitants of the Casamero community used miscellaneous cherts during the Basketmaker III period, fossiliferous cherts during the Early Pueblo II period, and Chinle chert during the Late Pueblo II period.

When compared with a study of the material from Pierre's parcel, the Casamero analysis contained 26.6 percent groundstone while the Pierre's Complex contained 8.8 percent. Casamero contained 1.4 percent hammerstones, while Pierre's contained 4.7 percent. If these values are true, then it may have been that more grinding activities were being conducted in the Casamero community, thereby suggesting a stronger farming association. In contrast, the Pierre's community may have had more lithic reduction activities than at Casamero, with less farming. Granted, this is a simplistic deduction which may only be a product of sampling error, but it may merit future considerations.

Ceramic Exchange Patterns

As presented in Chapter 7, the ceramics of both Casamero and the Pierre's parcels were analyzed. The results demonstrate marked differences between the two outliers. As defined by Mills (Chapter 7) and in order to assess the concentrations of local versus nonlocal ceramics, two assumptions were made. The first is that all Cibola Whitewares and Graywares are considered locally made. The second is that all non-Cibola wares are nonlocal. Other variables are discussed in Chapter 7.

The comparison of the two outliers is quite interesting. The Casamero sample contains almost exclusively local wares. This is not unusual for southern Chaco outliers (Mills 1986; Toll 1985). In contrast, the Pierre's parcel contains relatively high percentages of nonlocal wares, although there is much variation on a site-to-site basis. Several explanations for this are presented. It might be that the Casamero community was more established within a stable farming community with fewer outside influences; ceramics indicate that by Early Pueblo II times the Casamero inhabitants were firmly established. If this area was better suited environmentally for farming and production was generally good, then fewer outside trade goods might be needed. In fact, areas like Chaco Canyon may have relied on the Casamero community during lean agricultural years and much of the trade may have traveled north and away from Casamero. In contrast, Pierre's community was not established until Late Pueblo II, and there does not appear to have been a community in place before that time. Does this indicate that the area was a more marginal environment with less agricultural potential and that its desirability was more for its physical location between Chaco Canyon and settlements to the north? The high concentration of nonlocal ceramics suggests that the Pierre's community was engaged much more in regional trade with less local dependence. It may be that the presence of the North Road cutting through the area enabled the emphasis on trade to be dominant at least during the Early Pueblo III times.

Navajo Site

Only one probable Navajo site was observed within the Casamero parcel. Site LA 67159 consisted of a corral constructed of axe-cut juniper trees and limbs. Herding has been an economic base for the Navajo since they acquired sheep during the Gobernador Phase. The degree of deterioration of the wood utilized in the structure suggested a date of ca. 1900.

Photograph courtesy of Tom Obenauf.

CHAPTER 7

CHRONOLOGICAL, DISTRIBUTIONAL, AND FUNCTIONAL ANALYSES OF THE CERAMIC ASSEMBLAGES FROM CASAMERO AND PIERRE'S COMPLEX SURVEYS[1]

Barbara J. Mills

Ceramic data recorded during the survey of the Casamero and Pierre's Complex parcels (Harper et al. 1988) provide a basis for investigating several research questions of interest in the study of the Chaco regional system. Although each of the two outlier communities has received some prior archaeological attention, previous ceramic analyses have concentrated on chronological placement (e.g., Marshall et al. 1979; Powers et al. 1983). Additional questions that may be asked of the ceramic data from these two communities, such as the role of each outlier community in regional trade networks and the content of ceramic assemblages in functional terms, have not yet been systematically addressed. This chapter will bridge the gap in our knowledge about ceramic assemblages within the two outlier communities by presenting data on chronology, exchange, and assemblage content. These topics are addressed following a brief discussion of field and analytical techniques.

Field and Analytical Techniques for Ceramic Analysis

Ceramic data were recorded at the surveyed sites for each separate provenience with ceramic artifacts. All identifications were made by myself to insure consistency. As with the lithic assemblages, ceramic assemblages were systematically sampled using one of two methods. First, for proveniences that were assessed as having fewer than 100 sherds present, an "all observed" sample was recorded. This sampling technique involved the use of pin flags to identify all sherds present and then to record them. The second sampling technique used a "discrete" or quadrat sample of varying size that was usually laid out on the midden area. If 100 sherds were not present within the sample area, the area was expanded until this minimum sample size was reached.

As a result of this flexible sampling design, a total of 6,430 sherds at the 66 sites with ceramics were recorded from both Casamero and Pierre's complex. Because several of these sites had multiple proveniences, each of which were sampled separately, a total of 83 separate ceramic assemblages was used in the analyses below. Of these 83 assemblages, 48 were sampled using the "all observed" technique, while the remaining 35 were sampled using discrete sample areas. A Chi-square test indicates that there is no statistical difference in the frequency of one sample type vs. another between the two areas (Table 7.1), suggesting comparability of the two areas at the level of sampling strategy.

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[1] This chapter initially appeared as Chapter 6 in Harper et al. (1988).

Table 7.1. Cross-tabulation of assemblage sample type by survey area.

Sample Type	Survey Area		Total
	Casamero	Pierre's	
All Observed (cell chisq)	24 (0.254584)	24 (0.316509)	48
Discrete (cell chisq)	22 (0.349143)	13 (0.43407)	35
Total	46	37	83

Chi-Square = 1.354 (1 df). Prob = 0.245. Cramer's V = -0.128.

In addition to provenience and sampling data, the field recording format included information on ceramic ware, stylistic type within each ware (if identifiable) and vessel form. Ware identifications were confirmed through the inspection of a fresh break using a 10 power hand lens. The specific criteria used to identify stylistic types are discussed below in the section on ceramic chronology. Data recorded on the field forms were later entered into a DBASE III file, which was subsequently converted to a SAS data set for analysis using SAS-PC (Version 6.1; SAS Institute 1985a, 1985b).

Techniques used for the analysis of ceramic data include both descriptive and inferential statistics. Techniques of exploratory data analysis such as stem-and-leaf displays and boxplots have been used frequently in the following analyses. Descriptions of these and other techniques of exploratory data analysis may be found in Tukey (1977) and Hartwig and Dearing (1979).

The three primary research questions addressed below–chronology, exchange, and function–each require that a different approach be taken to classification. For this reason, separate sections on typological considerations are presented below at the beginning of the discussion of each research topic.

Chronological Analyses

Two different analyses were used to assign chronological placement. The first analysis used South's (1977) mean date formula as an objective statistical way of deriving the relative chronological placement of each site assemblage. The second chronological analysis used the mean date and a subjective assessment of the range of stylistic variation present in each assemblage to assign it to one of several broad ceramic periods. Both of these techniques of chronological ordering are discussed following a description of the taxonomic units used for analysis. The section on chronology concludes with considerations of several ceramic assemblage changes through time, and with a summary of the dating of great house and road associated features.

Chronological Types

The type-variety system used in traditional Southwestern ceramic analysis includes information at both spatial and temporal scales. The

principle advantage of the type-variety system is that because chronological control was a major goal of its developers, stylistic variation is now a very useful tool of relative chronology. The vast amount of archaeological work that has been conducted in the Ancestral Pueblo area has allowed continual updating of production span estimates for the ceramics that occur on the two survey parcels.

One of the primary concerns during ceramic data recording and its subsequent analysis was comparability of taxonomic units. If the two Chacoan outliers are to be compared with each other and with other outliers within the regional system, then the same classification criteria must be used. Therefore, the separate stylistically based type designations used by some researchers to describe Cibola Whiteware and Cibola Grayware in areas surrounding Casamero (e.g., Dittert 1959; Hargrave 1964; Neller 1978, Chapter 5) were not used during the present project. This decision follows that of Marshall et al. (1979), who were also concerned with regional level comparisons; Lang (1982); and in part, Sigleo (1981, Chapter 4).

For the two major local wares, Cibola Grayware and Cibola Whiteware, the system of stylistic classification used on this project is the same as described by McKenna and Toll (1984) and Windes (1984) for Chaco area assemblages. Where minor discrepancies are present between these two descriptive systems (e.g., in the differentiation of Escavada from Puerco styles), the present system follows McKenna and Toll more closely. This same recording system was also used during a recent survey of two other outlier communities, Kin Klizhin and Kin Bineola (Mills 1986; Powers n.d.). Analyses of the ceramic data from the survey of the Casamero and Pierre's complex parcels can therefore be compared with confidence to the ceramic analyses of these two other outlier communities, as well as to the large body of work recently completed by the National Park Service in Chaco Canyon itself.

Table 7.2 presents the stylistic types of each ware recorded within the two survey areas surrounding the Casamero and Pierre's outliers. Complete ceramic inventories for each site sample by ware, type and form can be found in the appendices in Harper et al. (1988).

As noted above, the stylistic types within Cibola Whiteware were differentiated using the same criteria as recent investigations in the Chaco Basin. This system avoids the use of the varieties of Puerco Black-on-white defined by the Cibola Whiteware Conference (1958) by keeping Escavada, Gallup and Puerco as stylistically separate types.

In a minor semantic departure from McKenna and Toll (1984) and Windes (1984), the present classification system uses Kiatuthlanna Black-on-white instead of "Early Red Mesa." This system of classification is also comparable to recent Office of Contract Archeology analyses of Cibola Whiteware from the Quemado area (Mills 1988), with the addition of Chaco and Chaco-McElmo black-on-whites to the range of stylistic types discussed, and the correlative absence of Reserve and Tularosa black-on-whites. Chaco-McElmo Black-on-white is the only stylistic type of Cibola Whiteware painted with carbon, rather than mineral, paint.

Nonlocal painted wares that occur within the project areas include Mesa Verde Whiteware, Chuska Whiteware, Tusayan Whiteware, Socorro Whiteware, San Juan Redware, Chuska Orangeware, White Mountain Redware, Tsegi Orangeware, and Mogollon Redware. These wares are differentiated from each other and from the presumably locally produced Cibola Whiteware by differences in slip color and paste characteristics, particularly in temper type.

Table 7.2. Ceramic type frequencies by survey area.

	Survey Area				
	Casamero		Pierre's		
Ceramic Type	N	%	N	%	Total
CIBOLA WHITEWARE					
La Plata B/w	2	0.05	0	0.00	2
White Mound B/w	6	0.15	0	0.00	6
Kiatuthlanna B/w	16	0.40	0	0.00	16
Red Mesa B/w	242	6.10	3	0.12	245
Escavada B/w	15	0.38	48	1.95	63
Puerco B/w	9	0.23	4	0.16	13
Gallup B/w	221	5.50	92	3.74	313
Chaco B/w	0	0.00	5	0.20	5
Chaco-McElmo B/w	1	0.03	39	1.58	40
BMIII-PI Cibola Whiteware	15	0.38	0	0.00	15
PII-III Cibola Whiteware	470	11.85	119	4.83	589
Unid. Cibola Whiteware	472	11.90	269	10.92	741
MESA VERDE WHITEWARE					
Mancos B/w	0	0.00	5	0.20	5
McElmo B/w	0	0.00	6	0.24	6
McElmo-MV B/w	0	0.00	20	0.81	20
Mesa Verde B/w	0	0.00	2	0.08	2
PII-III MV Whiteware	0	0.00	2	0.08	2
Unid. MV Whiteware	0	0.00	19	0.77	19
CHUSKA WHITEWARE					
Newcomb B/w	0	0.00	1	0.04	1
Chuska B/w	0	0.00	12	0.49	12
Brimhall B/w	0	0.00	2	0.08	2
Toadlena B/w	0	0.00	11	0.45	11
Nava B/w	0	0.00	7	0.28	7
Crumbled House B/w	0	0.00	2	0.08	2
Unid. Chiska Whitware	0	0.00	46	1.87	46
TUSAYAN WHITEWARE					
Sosi B/w	1	0.03	5	0.20	6
Dogoszhi B/w	0	0.00	1	0.04	1
Unid. Tusayan Whiteware	0	0.00	3	0.12	3
SOCORRO WHITEWARE					
Socorro B/w	1	0.03	0	0.00	1

Table 7.2. Continued.

Ceramic Type	Survey Area: Casamero N	Casamero %	Pierre's N	Pierre's %	Total
SAN JUAN REDWARE					
Unid. San Juan Redware	1	0.03	0	0.00	1
CHUSKA ORANGEWARE					
Sanostee R/o	0	0.00	1	0.04	1
TSEGI ORANGEWARE					
Tusayan Polychrome	0	0.00	1	0.04	1
Unid. Tsegi Orangeware	0	0.00	8	0.32	8
WHITE MT. REDWARE					
Puerco B/r	1	0.03	16	0.65	17
Wingate B/r	1	0.03	7	0.28	8
Unid. White Mt. B/r	3	0.08	6	0.24	9
Unid. White Mt. Redware	3	0.08	5	0.20	8
MOGOLLON REDWARE					
Forestdale Red Smudged	0	0.00	3	0.12	3
Unid. Smudged Mogollon Redware	0	0.00	1	0.04	1
CIBOLA GRAYWARE					
Lino Gray & Fugitive Red	38	0.96	1	0.04	39
Plain Gray	1259	31.74	45	1.83	1304
Kana-a Neckbanded	15	0.38	0	0.00	15
Narrow Neckbanded	27	0.68	2	0.08	29
Neck Corrugated	16	0.40	5	0.20	21
Unid. Plain Corrugated	347	8.75	7	0.28	354
Unid. Indented Corrugated	720	18.15	1305	52.98	2025
PII Rims	40	1.01	1	0.04	41
PII-III Rims	14	0.35	23	0.93	37
PIII Rims	5	0.13	36	1.46	41

Table 7.2. Continued.

Ceramic Type	Survey Area: Casamero N	Casamero %	Pierre's N	Pierre's %	Total
CHUSKA GRAYWARE					
Newcomb Corrugated	0	0.00	2	0.08	2
Blue Shale Corrugated	0	0.00	13	0.53	13
Hunter Corrugated	0	0.00	28	1.14	28
Unid. Corrugated Chuska Grayware	0	0.00	162	6.58	162
Unid. Chuska Grayware	0	0.00	3	0.12	3
UNID. ANASAZI WARES					
Unid. B/r	0	0.00	1	0.04	1
Unid. whiteware	2	0.05	14	0.57	16
Unid. grayware	0	0.00	2	0.08	2
Unid. ware	4	0.10	7	0.28	11
QUEMADO GRAYWARE					
Dinetah Gray	0	0.00	23	0.93	23
Pinyon Gray	0	0.00	1	0.04	1
Unid. Quemado Grayware	0	0.00	3	0.12	3
NAVAJO PAINTED					
Gobernador Polychrome	0	0.00	5	0.20	5
Navajo Painted	0	0.00	5	0.12	3
TOTAL	3967		2463		6430

Stylistic types recognized within Mesa Verde Whiteware follow those described by Breternitz et al. (1974). Due to difficulties that often arise in differentiating McElmo and Mesa Verde black-on-whites, a composite category was often relied on. All McElmo and Mesa Verde black-on-whites identified during the present project were carbon painted and tempered with crushed rock, while all Mancos Black-on-white was painted with mineral pigments. Differentiation of McElmo Black-on-white from Mesa Verde Black-on-white was mainly based on design layout; Mesa Verde has a more negative design style than McElmo and its design fields are not set apart by the use of wide, often multiple bands.

Chuska Whiteware may be differentiated from other whitewares by its distinctive trachyte temper. The stylistic sequence within this whiteware has been differentiated by Peckham and Wilson (n.d.), which formed the basis for Windes' (1977) published descriptions. Chuska Whiteware contains two series, one executed with carbon paint, and the other with mineral paint. Only one type within the mineral painted series, Brimhall Black-on-white, was recorded during the present project. All other Chuskan White-ware recorded was carbon-painted.

Other whitewares recorded during the present project are Tusayan Whiteware and Socorro Whiteware. Tusayan Whiteware is

carbon-painted and tempered with fine sand (Colton and Hargrave 1937). Only two stylistic types within this ware were recorded–Sosi and Dogoszhi black-on-whites. One sherd of the mineral-painted Socorro Black-on-white was identified. A description of this type may be found in Hawley (1936).

Several different red or orange wares were identified in the survey assemblages. The most numerous among these was White Mountain Redware. The published descriptions of Carlson (1970) were followed here. No White Mountain Redware polychromes were recorded in any of the assemblages. San Juan Redware was differentiated on the basis of crushed rock temper (Breternitz et al. 1974). One sherd of an unidentified type within this ware was recorded within the Casamero parcel. One sherd of another early oxidized ware, Chuska Orangeware (Peckham and Wilson n.d.; Windes 1977), was recorded on the Pierre's parcel. As with the whiteware from the same area, Chuska Orangeware is trachyte-tempered. Several sherds of the later sherd-tempered Tsegi Orangeware (Colton and Hargrave 1937) were present on the Pierre's parcel, but only one was identifiable to stylistic type (Tusayan Polychrome). Several sherds of polished Mogollon redwares with brownware pastes and smudged surfaces were recorded in the Pierre's area. Although some of these have been designated as Forestdale Red (following Haury 1940), it seems likely that these may be a later smudged redware.

Ancestral Pueblo plainwares include only two wares: Cibola Grayware and Chuska Grayware. The former is usually sand-tempered, while the latter is trachyte-tempered.

Cibola Grayware stylistic type differentiations follow those of McKenna and Toll (1984). Only rim sherds were used to identify Lino Gray. All other plain gray was tallied separately because these sherds cannot be unequivocally determined to be parts of Lino Gray vessels or the lower body of neck banded or neck corrugated vessels. Vessel portion is also an important means of differentiating Kana-a Gray (wide neckbands), Narrow Neckbanded (flattened bands) and Neck Corrugated (either clapboard or indented corrugated) styles. Most body sherds with corrugations were assigned to either the unidentified Plain Corrugated or Indented Corrugated categories. Corrugated rims were placed in three rim eversion categories: Pueblo II, Pueblo II-III, or Pueblo III. Pueblo II rims are more direct, while Pueblo III rims are everted. The Pueblo II-III category was used when the differentiation was uncertain.

As with Chuska Whiteware, Chuskan Grayware types follow descriptions of Peckham and Wilson (n.d.), and Windes (1977). None of the types in this ware earlier than Newcomb Corrugated were present in the survey assemblages. As used in the present survey, Newcomb Corrugated is the stylistic equivalent to Neck Corrugated within the Cibola Grayware; Blue Shale Corrugated is equivalent to Cibola Grayware Pueblo II rims; while Hunter Corrugated is the Chuskan equivalent of Cibola Grayware Pueblo III rims. All corrugated body sherds were recorded as "Unidentified Corrugated Chuska Grayware."

South's Mean Date Formula

Although the mean date formula has been previously applied to Southwestern ceramic assemblages (Gomolak 1980; Kincaid 1983), its potential has not been fully realized. The results derived from the use of the mean date formula have been found to compare favorably with the results of more sophisticated seriation multivariate methods, such as multidimensional scaling (Durand and Hurst n.d., 2003), suggesting that it may be a valid chronological indicator for Southwestern assemblages. But, as with multidimensional scaling and any other seriation methods that assign a single date to each assemblage, it should be recognized that neither

duration of occupation nor multiple occupations are taken into account with the use of the mean date formula. Despite these methodological drawbacks, the mean date formula does provide an estimation of assemblage date that is able to be replicated for comparisons at the regional level.

As developed by South (1977), the mean date formula is a simple statistical technique for obtaining the same results that many archaeologists produce when date ranges for each ceramic type present in an assemblage are plotted, and date ranges are assigned based on the overlap of the production spans for each type. In contrast to these presence/absence assessments, the formula uses the relative frequencies of types present, an important factor in how accurate the results are with respect to the true date of assemblage formation (South 1977:217).

South's formula requires three input variables for each assemblage. The first one is ceramic type. The second is the median date for each of the ceramic types present in the assemblage. This is determined through some prior knowledge of the production span of each ceramic type. The third variable is the frequency of sherds of each ceramic type. For each assemblage, the sum of all median dates by type are first derived by multiplying the median date for a type by the frequency of that type in an assemblage. These are in turn summed together and then divided by the total number of sherds.

While the use of the mean date formula generally provides results that can be replicated, the accuracy of the results in providing a temporal assignment is subject to several assumptions. South (1977:203, 206) identified several of these in his original discussion: 1) breakage begins soon after the acquisition of a ceramic type, 2) types of all ages are broken, and are associated in trash deposits, 3) breakage is largely proportional to use, 4) end dates can be determined by small frequencies of later types, and 5) the popularity of a ceramic type generally conforms to a unimodal curve.

In essence, all five of these assumptions are related to one general underlying assumption: that the ceramic types being used are stylistic, not functional, types. A definition of stylistic types as those that are unimodally and normally distributed through time is used here. The battleship-shaped curve of early chronology building in Americanist archaeology is built upon observation of this phenomenon. In contrast, functional types are those that crosscut spatial and temporal boundaries. Thus, functional types are less useful for chronological control than stylistic types because the distribution of functional types through time is based on selective pressures that are not normally (but not necessarily randomly) distributed (Dunnell 1978; Meltzer 1981).

It is somewhat surprising that South did not specifically control for functional variation in assemblages before applying the mean date formula, especially given his interest in assemblage content presented elsewhere in the same volume. The impact of interassemblage functional variation on the dating of two contemporaneous sites may be appreciated with a simple example. For instance, if one assemblage has twice as many sherds of a particular plainware than another, and that plainware type has a median date twenty years later than the predominant painted ware, then the assemblage with more plainware must have a later mean date than the assemblage with a higher frequency of painted ware, even if the two were occupied at exactly the same time.

South may not have controlled for function because sample sizes become very small. This is particularly true when there are large numbers of sherds not able to be positively identified to stylistic types in an assemblage, a frequent occurrence in Southwest assemblages. In the

analysis of the assemblages analyzed here, a compromise was reached between the functional and sample size considerations by including all painted types, but only those plainwares that were more tightly dated than others. This sample excludes plain grayware and indented corrugated grayware, both of which have extremely long production spans. All of the plainware types that were included are present in very low frequencies, and it is not expected that differences in assemblage function will greatly affect the chronological determinations made with the mean date formula.

Table 7.3 lists all of the stylistic types used for deriving mean dates for each ceramic assemblage recorded during the present project, and the estimated production span for each style. The accuracy of production span estimate for each stylistic type is essential to the accuracy of the mean date estimates. Many of the production span estimates that are present in the literature have not been updated with more recent chronometric information. The production spans used here are based on recent evaluations of the chronology of stylistic sequences within each ware (see references at end of Table 7.3).

The distribution of mean dates derived through the above technique are shown in stem-and-leaf displays in Figure 7.1. Figure 7.1A shows the distribution for each survey parcel by a 50-year intervals, while Figure 7.1B is organized by decades. The horizontal axes show mean dates by 10-year intervals. Thus, in Figure 7.1A there is one mean date of A.D. 690, two mean dates of A.D. 700, one of A.D. 910, and so on.

As the 50-year interval figures indicate, nearly all assemblages within both survey parcels date from A.D. 900 to 1150. On the Casamero parcel, there are three assemblages that date to around A.D. 700. All of these early Casamero parcel assemblages were recorded at three different proveniences of the same site, LA 50397, located on top of the mesa to the north of the main community. This site contained a large kiva depression and a masonry room block. Based on masonry style, the latter feature suggests a later component, but only a few sherds recorded in any of the three samples date to the Pueblo II period or later.

As on the Casamero parcel, one assemblage on the Pierre's parcel dates to around A.D. 700. This assemblage was recorded at one provenience of a multi-component site, LA 66022. An additional numerical outlier within the distribution of mean dates from the Pierre's assemblage is one date at A.D. 1250. This date was derived for the assemblage from Sample 2 at LA 16509. Only one diagnostic sherd was present at this site, however, and this late date may be a sampling phenomenon.

When the above identified very early or very late dates are removed from the distribution of mean dates for each parcel, and the dates are displayed along a ten-year scale, temporal differences between the two areas are brought out more clearly (Figure 7.1B). The distribution of dates from the Casamero community are concentrated between A.D. 950 and 1050, while those from the Pierre's community begin at A.D. 1050 and continue through A.D. 1130. The distribution of these dates suggests that the use of the two areas was not entirely contemporaneous.

Ceramic Phases

As noted above, the assemblage dates based on the mean date formula are only derived from samples of stylistically identified types. The second portion of the chronological analysis relied on a comparison of the total assemblage with the ideal ceramic groups shown in Table 7.4, to supplement the information derived from

Table 7.3. Date ranges for stylistic types used in chronological analyses.

Type Code	Type Name	Begin Date	End Date	Median Date
CIBOLA WHITEWARE [a]				
01	La Plata B/w	650	750	700
02	White Mound B/w	700	850	775
12	Kiatuthlanna B/w	850	900	875
03	Red Mesa B/w	900	1050	975
04	Escavada B/w	925	1125	1025
06	Gallup B/w	1000	1125	1063
05	Puerco B/w	1000	1175	1088
07	Chaco B/w	1075	1150	1113
08	Chaco-McElmo B/w	1100	1200	1150
13	Reserve B/w	1100	1200	1150
MESA VERDE WHITEWARE [b]				
23	Mancos B/w	900	1150	1025
24	McElmo B/w	1075	1275	1175
25	McElmo-Mesa Verde B/w	1075	1300	1188
26	Mesa Verde B/w	1200	1300	1250
CHUSKA WHITEWARE [c]				
32	Newcomb B/w	875	1000	938
34	Chuska B/w	1000	1125	1063
35	Brimhall B/w	900	1075	988
36	Toadlena B/w	975	1125	1050
37	Nava B/w	1100	1275	1188
38	Crumbled House B/w	1150	1300	1225
TUSAYAN WHITEWARE [d]				
94	Sosi B/w	1070	1180	1125
95	Dogoszhi B/w	1040	1210	1125
TSEGI ORANGEWARE [e]				
19	Tusayan Polocyrome	1125	1290	1208
CHUSKA ORANGEWARE [f]				
92	Sanostee R/o	825	875	850

Table 7.3. Continued.

Type Code	Type Name	Begin Date	End Date	Median Date
WHITE MOUNTAIN REDWARE [g]				
40	Puerco B/r	1000	1175	1088
41	Wingate B/r	1050	1200	1125
43	St. Johns B/r	1200	1300	1250
42	Wingate Polychrome	1200	1300	1250
44	St. Johns Polychrome	1200	1300	1250
CIBOLA GRAYWARE[h]				
60	Lino Gray	575	800	688
62	Kana-a Neckbanded	800	900	850
63	Narrow Neckbanded	850	950	900
64	Neck Corrugated	950	1050	1000
CHUSKA GRAYWARE [i]				
75	Newcomb Corrugated	875	950	913
76	Blue Shale Corrugated	925	1150	1038
77	Hunter Corrugated	1100	1300	1200

Key to ceramic ware references:
[a] McKenna and Toll (1984); Mills (1988); Windes (1984)
[b] Breternitz et al. (1974)
[c] Windes (1977)
[d] Ambler (1985)
[e] Ambler (1985)
[f] Windes (1977)
[g] Carlson (1970); Mills (1988)
[h] McKenna and Toll (1984)
[i] Windes (1977)

the mean dates. The ceramic groups composed of associated stylistic types are considered as "ideal" because many underlying variables may affect the presence/absence assemblage.

The ceramic phase system used here employs equal sized temporal intervals of one hundred years (except for Basketmaker III). Each of these ceramic periods has been given a designation such as "Early Pueblo II" or "Late Pueblo II." The interval boundaries at twenty years after the turn of each century were chosen to be congruent with phase boundaries developed for the central Chaco Canyon area (Toll et al. 1980). Thus, Early Pueblo II used here is the same as the Early Bonito Phase; Late Pueblo II is the same as Middle or Classic Bonito Phase; and Early Pueblo III here is the same as the Late Bonito Phase.

A.

	CASAMERO			PIERRE'S	
	Stem	Leaf		Stem	Leaf
M	12		M	12	5
E	12		E	12	
A	11		A	11	
N	11		N	11	0111122233
	10	55555566667		10	56666666777788899
D	10	112222233333444	D	10	14
A	9	55567777789	A	9	
T	9	1	T	9	
E	8		E	8	
	8			8	
	7			7	
	7	00		7	
	6	9		6	9

Multiply Stem.Leaf values by 10**+2

B.

	CASAMERO			PIERRE'S	
	Stem	Leaf		Stem	Leaf
	112			112	1459
	111			111	346
	110			110	88
M	109		M	109	229
E	108		E	108	00
A	107	3	A	107	016
N	106	333	N	106	3333369
	105	9		105	99
D	104	13888889	D	104	38
A	103	3446	A	103	
T	102	1178	T	102	
E	101	3679	E	101	1
	100	9		100	
	99	1		99	
	98	4		98	
	97	15		97	
	96	3689		96	
	95	235		95	
	94			94	
	93			93	
	92			92	
	91	4		91	

Multiply Stem.Leaf values by 10**+1

Figure 7.1. Stem-and-leaf displays of mean dates by survey area. Figure A shows all dates, with 50 year vertical scale. Figure B shows same distribution with numerical outliers removed on 10 year vertical scale. (From Harper et al. 1988:Figure 6.1A and B).

It should be noted that the more anonymous designations of Early and Late Pueblo I, II and III used here are not completely congruent with those used by Marshall et al. (1979) or Powers et al. (1983) because both of these studies have shortened the Pueblo II period to match ceramic with architectural developments. For a concordance of several phase systems that have been used in the Chaco area, including the one most comparable to the present study (Toll et al. 1980), the reader is referred to Figure 3 in Powers et al. (1983:13), which forms the basis of our Figure 3.1.

Table 7.4. Ceramic phases and associated stylistic types.

Ceramic Phase (ca. Dates A.D.)	Associated Local Stylistic Types[a]	Associated Nonlocal Stylistic Types
Basketmaker III (pre-720)	Lino Gray, Fugitive Red, La Plata B/w, White Mound B/w	
Early Pueblo I (720-820)	Lino Gray, Fugitive Red, Kana-a NB, La Plata B/w, White Mound B/w	Sanostee R/o
Late Pueblo I (820-920)	Kana-a NB, Narrow NB, White Mound B/w, Kiatuthlanna B/w, Red Mesa B/w	Newcomb Corrugated, Newcomb B/w
Early Pueblo II (920-1020)	Narrow NB, Neck Corrugated (PII Rims), Red Mesa B/w, Escavada B/w, Gallup B/w, Puerco B/w	Newcomb Corrugated, Blue Shale Corrugated, Newcomb B/w, Chuska B/w, Puerco B/r
Late Pueblo II (1020-1120)	Neck Corrugated, Indented Corrugated (PII Rims), Red Mesa B/w, Escavada B/w, Gallup B/w, Puerco B/w, Chaco B/w, Chaco-McElmo B/w	Blue Shale Corrugated, Hunter Corrugated, Mancos B/w, McElmo B/w, Chuska B/w, Puerco B/r, Wingate B/r, Wingate Polychrome, Sosi B/w, Dogoszhi B/w
Early Pueblo III (1120-1220)	Indented Corrugated (PIII Rims), Escavada B/w, Gallup B/w, Puerco B/w, Chaco B/w, Chaco-McElmo B/w	Blue Shale Corrugated, Hunter Corrugated, McElmo B/w, Mesa Verde B/w, Chuska B/w, Toadlena B/w, Nava B/w, Crumbled House B/w, Puerco B/r, Wingate B/r, Wingate Polychrome, St. Johns B/r, St. Johns Polychrome, Tusayan Polychrome, Sosi B/w, Dogoszhi B/w
Late Pueblo III (1220-1320)	Indented Corrugated (PIII Rims), Chaco-McElmo B/w	Hunter Corrugated, McElmo B/w, Mesa Verde B/w, Nava B/w, Crumbled House B/w, St Johns B/r, St. Johns Polychrome

[a] These are ideal assemblages, presented only as guidelines. Use of heirloom items, reuse of vessels and/or sherds from previous occupations, site function, duration of occupation, and reoccupation of sites will all affect the presence/absence (and relative frequencies) of types in any particular assemblage. Local types are those of Cibola Whiteware (Puerco-Chaco Series) and Cibola Grayware.

Using the phase system outlined above and in Table 7.4, most of the assemblages in the Casamero area were dated to the Early Pueblo II or Late Pueblo II periods. Most assemblages in the Pierre's area, on the other hand, were placed in the Late Pueblo II or Early Pueblo III periods. Phase designations for each site assemblage sampled are listed in Harper et al. (1988: Appendix 2), along with all other summary data by site and sample number.

Summary of Temporal Trends in the Ceramic Assemblages

We are now in a position to summarize the temporal trends present in the ceramic assem-

blages from the Casamero and Pierre's survey areas. Four different chronologically sensitive variables are summarized below: 1) Cibola Whiteware style changes, 2) shifts from plain to corrugated graywares, 3) changes in Cibola Grayware jar rim form, and 4) change in the use of carbon vs. mineral painted whitewares.

Cibola Whiteware Stylistic Change

Figure 7.2 shows the distribution of Cibola Whiteware stylistic type percentages through the main phases represented within the two survey areas. These percentages are calculated as a proportion of all Cibola Whiteware, including unidentified styles. Figure 7.2A illustrates Early Pueblo II and Late Pueblo II assemblages from Casamero. The bar charts indicate a clear separation of assemblages that are dominated by Red Mesa Black-on-white (Early Pueblo II) from those dominated by Gallup Black-on-white (Late Pueblo II).

Figure 7.2B illustrates Late Pueblo II and Early Pueblo III assemblages from the Pierre's area. In contrast to the Casamero graphs, those from Pierre's do not show the dominance of one Cibola Whiteware style in any particular period. The Late Pueblo II period at Pierre's contains relatively high percentages of Gallup Black-on-white, but more Escavada and Chaco Black-on-white percentages than within the Casamero area. Some of these differences may be based in finer temporal contrasts between the two areas that are masked by the phase system. The mean dates have shown that the Pierre's area Late Pueblo II assemblages tend to fall in the latter half of this phase, while those from Casamero in the earlier half.

Assemblages assigned to the Early Pueblo III period are only present at the Pierre's site. These assemblages contain almost equal percentages of Gallup and Chaco-McElmo black-on-whites (Figure 7.2B, bottom). Chaco Black-on-white is absent during this phase, but surprisingly high Red Mesa and Escavada black-on-whites are present, which may indicate that sites dating to this period have a greater chance of having earlier components.

Grayware Stylistic Change

The shift from plain gray to neckbanded to neck corrugated to an all over corrugated surface treatment is one of the more firmly dated trends in Ancestral Pueblo ceramic chronology. As with Cibola Whiteware stylistic change, these shifts are not totally independent of the assignment of phase designations used here. But because painted types were focused on for both the mean date and phase assignments, the shift in the ratio of corrugated to plain gray sherds through time should be of interest for future studies, as well as for understanding when the shift to all over corrugated took place.

Table 7.5 summarizes the mean percentages of corrugated grayware by area and phase. Percentages of corrugated are calculated as a proportion of all grayware (Cibola and Chuska). Only those assemblages with 20 sherds or more are included to control for the effects of small sample size. As Table 7.5 indicates, there is a large rise in the percentages of corrugated ceramics between the Early and Late Pueblo II periods at Casamero. This trend is shown graphically in a bar chart of the same data (Figure 7.3). The bar chart and the summary table also show that for the same Late Pueblo II period, assemblages in the Pierre's area contain much higher percentages of corrugated than assemblages from the Casamero area. Because the mean dates suggest that the Pierre's area was not substantially occupied until after A.D. 1070, the high percentages of corrugated grayware in this area supports a transition to all over corrugated by this time, if not slightly earlier.

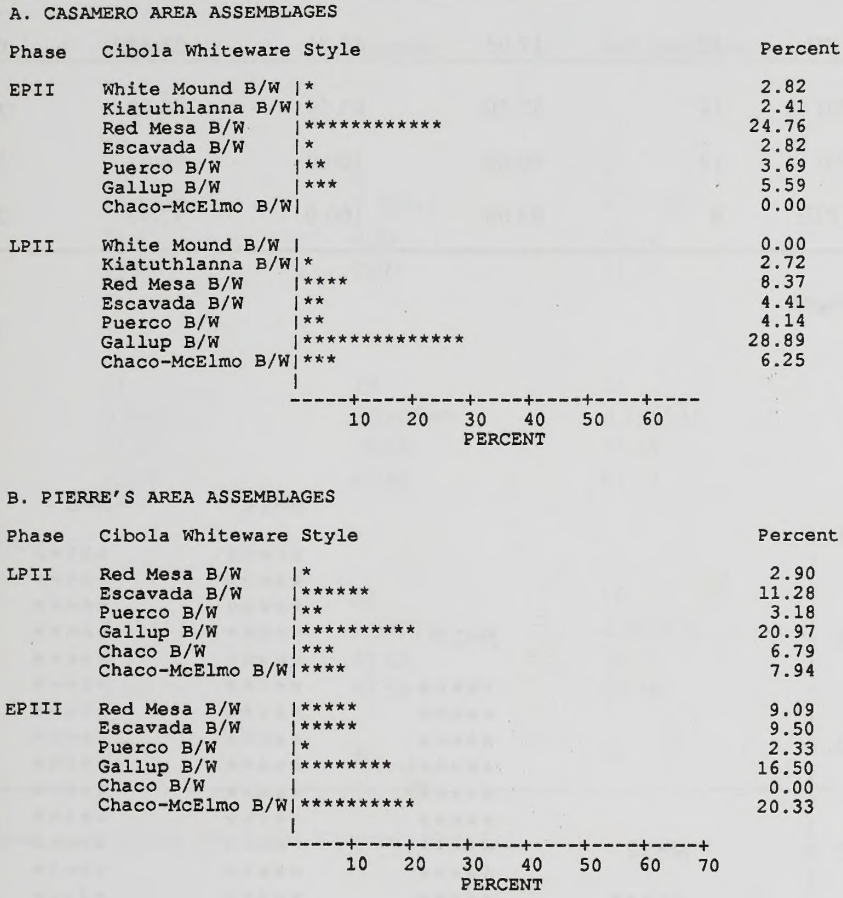

Figure 7.2. Mean percentages of identified Cibola Whiteware types by area and phase. N = number of assemblages. Percentages calculated as proportion of all Cibola Whiteware. (From Harper et al. 1988:Figure 6.2.)

Table 7.5. Summary statistics for the percent corrugated by survey area and phase.

Area	Phase	N	Min.	Max.	Mean	s.d.
Casamero	Early PII	12	17.95	45.71	28.48	6.79
Casamero	Late PII	17	32.50	93.59	69.98	17.33
Pierre's	Late PII	14	80.65	100.0	96.01	5.14
Pierre's	Early PIII	8	93.68	100.0	97.96	2.20

N = Number of assemblages.

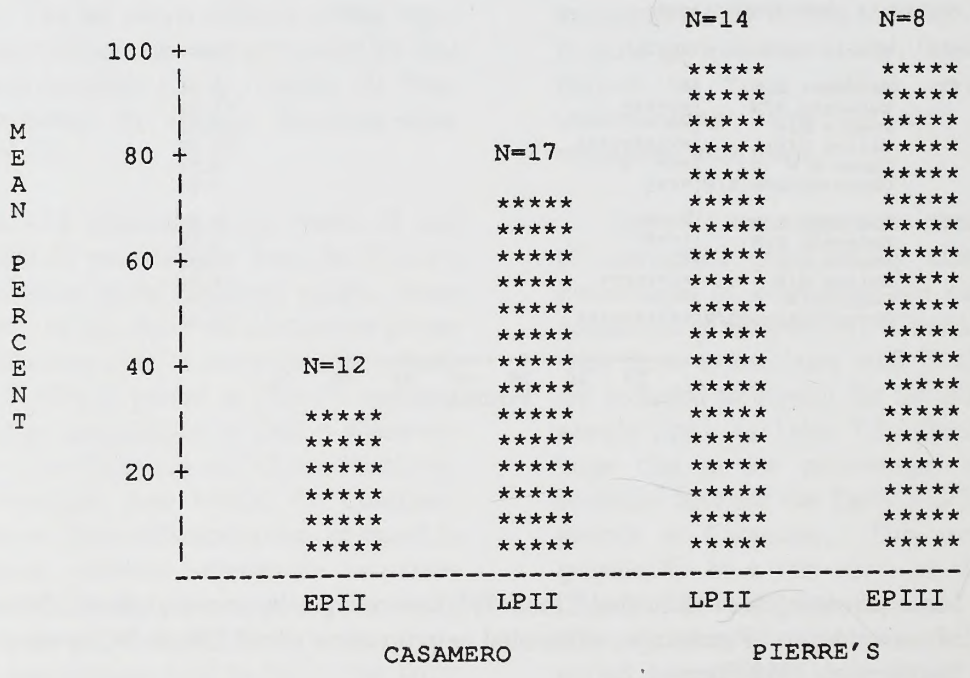

Figure 7.3. Mean percentages of corrugated plainware by total plainware by phase and survey area. (N = number of assemblages.) (From Harper et al. 1988:Figure 6.3).

Table 7.6. Cross tabulation of phase by rim form.

	Rim Form			
Phase	Direct	Everted	Indeterminate	Total
Early Pueblo II				
Frequency	18	0	4	22
Cell Chi^2	14.2953	7.58621	1.17102	
Row %	81.82	0.00	18.18	
Column %	45.00	0.00	11.11	
Late Pueblo II				
Frequency	21	19	22	62
Cell Chi^2	0.00673	0.264794	0.395501	
Row 5	33.87	30.65	35.48	
Column %	52.50	47.50	61.11	
Early Pueblo III				
Frequency	1	21	10	32
Cell Chi^2	9.12511	9.00011	0.000479	
Row %	3.13	65.63	32.15	
Column %	2.50	52.50	27.78	
Total	40	40	36	116

Chi^2=41.845, df=4, prob=0.000; Phi=0.601, Cramer's V=0.425.

Changes in Cibola Grayware Jar Rims

Change in the rim form of Cibola Grayware jars through the ceramic phases is shown in Table 7.6. As this table indicates, the Early Pueblo II period contains nearly equal percentages of direct versus everted rims. Finally, the Early Pueblo III period grayware rims are almost exclusively everted. A Chi^2 test indicates that this distribution is nonrandom.

As with the percentages of corrugated grayware to plainware, there are distinct differences between the two survey parcels for the Late Pueblo II period (Table 7.7). During this phase in the Casamero area, there was a higher frequency of direct rims, while in the Pierre's area direct rims were absent. These data lend further support for the suggestion that the Pierre's area Pueblo II occupation was in the latter half of this 100-year-long phase (from approximately A.D. 1070 to 1120), while the Casamero area was only used during the first half of this phase (from approximately A.D. 1020 to 1070).

Change in Use of Carbon Painted Whitewares

Toll (1985:129) notes a remarkable increase in the amount of carbon painted whiteware after about A.D. 1100 in the eastern Anasazi area. Table 7.8 presents summary statistics on the amount of carbon painted whiteware within assemblages from the two survey areas. Only

Table 7.7. Area and phase by rim form.

Area Phase	Rim Form			Total
	Direct	Everted	Indeterminate	
CASAMERO				
Early Pueblo II	18	0	4	22
Late Pueblo II	21	4	10	35
Casamero Total	39	4	14	57
PIERRE'S				
Late Pueblo II	0	15	12	27
Early Pueblo III	1	21	10	32
Pierre's Total	1	36	22	59

Table 7.8. Summary statistics for percent carbon painted whiteware by survey area and phase.

Area	Phase	N	Min.	Max.	Mean	s.d.
Casamero	Early Pueblo II	12	0.00	0.00	.	.
Casamero	Late Pueblo II	17	0.00	6.25	0.59	1.71
Pierre's	Late Pueblo II	14	0.00	64.29	15.52	17.65
Pierre's	Early Pueblo III	8	6.67	75.00	35.13	19.91

assemblages with 20 sherds or more are included, and only those that were dated to one of the ceramic phases.

As Table 7.8 indicates, carbon painted sherds are absent from Early Pueblo II assemblages and rare in Late Pueblo II assemblages within the Casamero area. In contrast, Late Pueblo II assemblages in the Pierre's area contained nearly 65 percent carbon painted whiteware, a tenfold increase over the same phase at Casamero. This fits with the pattern noted by other researchers that carbon-painted ceramics are rare in southern Chaco area assemblages, but because there are some finer temporal differences between Late Pueblo II assemblages in Casamero versus Pierre's areas, it is difficult to differentiate what is technological change through time and what is a shift in production areas (see also Toll 1985:221).

Early Pueblo III assemblages at Pierre's show only a slight increase in the use of carbon painted whitewares over the preceding period. Thus, Toll's observation about the dominance of carbon paint in late assemblages clearly applies to the ceramics of the Pierre's area, despite the tabulations presented by Powers et al. (1983:

Table 16) that indicate only about 6 percent of whiteware as carbon-painted. The data tabulated here suggests that the surge in carbon painted whiteware may have even occurred up to thirty years earlier than the A.D. 1100 date cited by Toll (1985:129) for Chaco Canyon proper.

Dating of Great Houses, Road Associated Features, and Comparison to Pueblo Alto

One of the concerns during the survey of the Casamero area was the representativeness of the sample from the midden of the Casamero Pueblo itself (LA 8779). Because this site had been extensively excavated, collected and stabilized, it was uncertain as to whether the surface sample would be comparable to samples recorded at other sites within the community. As a check on the dating using the surface sample, sherds from several excavated proveniences at Casamero at the Maxwell Museum of Anthropology, University of New Mexico, were tallied. Comfortingly, the mean date derived from 23 excavated proveniences within Kiva A, Room 8, Room 9, and Room 10 was A.D. 1046. This compares favorably with the A.D. 1048 mean date derived from the analysis of the surface sample recorded during the present project, as well as the only reported (noncutting) tree-ring date from Casamero of A.D. 1041 +vv (Chapter 5).

The two great houses on the top of Pierre's Butte (LA 16508 and LA 16509) had mean dates of A.D. 1070 and 1099, which would also place them in the Late Pueblo II ceramic phase. However, the total ceramics assemblage from LA 16509 is more suggestive of an Early Pueblo III phase designation, despite the fact that the two mean dates are remarkably similar to mean dates derived from independent samples reported on by Kincaid (1983:Table 9-10) at A.D. 1072 and 1098. Also, four tree-ring samples collected from the surface of House B (LA 16508) produced dates of A.D. 1109vv, 1109+v, 1108+vv, and 1000vv (Powers et al. 1983:114), in general slightly later than the mean ceramic date would indicate. The small tree-ring date cluster suggests the mean dates for House B reported here and by Kincaid (1983) may be too early, although it may also represent a slightly longer period of site use. Estimated occupation dates for House B presented by Powers et al. (1983:Table 17) conjecturally suggest pre-A.D. 1050 use of this unit in addition to a late A.D. 1000s/early 1100s date.

The large great house to the northwest of Pierre's Butte (LA 16515) has two associated midden areas. This site (which is called "El Faro" by Kincaid 1983:C23-25) is considered to be associated with the site on top of the nearby small butte; both are very close to the Great North Road. The sample from Midden B produced a mean date of A.D. 1108. Both of these samples indicate a (late) Late Pueblo II date. No absolute dates are available from this site, and these dates cannot therefore be independently evaluated. They do suggest at least partial contemporaneity with the use of the great houses on the Acropolis. The sample recorded for LA 16514, located at the pinnacle of the butte just north of LA 16515 produced a mean date of A.D. 1066, but still within the Late Pueblo II period.

Other road associated features include a possible herradura and associated scatter designated as LA 66016 that produced a mean date of A.D. 1059. Two artifact scatters located in the valley bottom near the pathway of the Great North Road were LA 66014 and LA 66015. Sample sizes of diagnostic sherds are not large at either of these two sites. The former site produced a mean date of A.D. 1071 while the latter produced a mean date of A.D. 1011. Finally, a small, possible road associated structure on a small butte, called "El Butito" (LA 16520) produced a mean date of A.D. 1059.

In summary, the great house at Casamero appears to be firmly dated in the middle eleventh century. In contrast, the great houses within the Pierre's area suggest use in the late eleventh and early twelfth centuries. Road associated features with ceramics within the Pierre's area, however, tend to date slightly earlier than the great house samples. These early dates may be because of sampling error, but nonetheless, they do not suggest use of the North Road after the use of the great houses. As Powers et al. (1983:131) note, there seems to be little evidence for Late Pueblo III ceramics associated with roads in the Pierre's area, even though Morenon has noted some elsewhere in the corridor of the Great North Road.

The dating of several great house proveniences at Pierre's in the last couple of decades of the eleventh century and in the early twelfth century is particularly interesting with respect to the dating of Pueblo Alto, the Chaco Canyon town site that is connected to the Pierre's complex via the Great North Road. Toll (1985:221) had noted that there is an ". . . apparent lack of synchronization between Alto as a fully functioning Chaco town and the northern outliers to which it is linked by road." His observation was based on the assumption that the Pierre's complex (along with Bis sa'ani) dates to the A.D. 1120s and 1130s, which are later than the terminal deposits in the trash mound at Pueblo Alto (Toll 1985:222).

But, the new data collected on this project suggests that the use of the Pierre's area up to fifty years earlier than the estimate used by Toll can be supported. Therefore, Pueblo Alto was at least in part contemporaneous with some sites in the Pierre's complex, and probably with the great houses themselves. If the road associated features in the Pierre's area are indeed earlier than the great houses of this area, then this would tie Pueblo Alto to northern areas by the A.D. 1060s—well before deposition in the Alto trash mound ended at about A.D. 1100 (Toll 1985: 220). Thus, the data collected on this project suggests that the Pierre's complex was not only physically tied to the closest Chacoan large town, but was also temporally linked. At this stage in our knowledge of the regional system, it is the intriguing persistence of site use in the Pierre's area after deposition in the trash mound at Pueblo Alto ended that is in need of further investigation.

Evidence for Ceramic Exchange

The ceramic ware identifications made in the field provide a means of assessing the relative contribution of local vs. nonlocal ceramics to each assemblage. Several assumptions or caveats must be stated at the outset. The first assumption is that all Cibola Whiteware and Cibola Grayware be considered as locally produced. Given the vast area that these two wares are considered to be local, however, it is likely that there was much exchange of these two wares within the Cibola area.

A second assumption is that all non-Cibola wares are indeed nonlocal. While this seems a safe assumption in most cases, it should be noted that it is indeed possible that recycling of non-local tempering materials via sherd temper was one strategy of local ceramic production. In the field, it was noted that some carbon painted whitewares had trachyte temper that was not of the same abundance as most of the sherds classified as Chuskan Whiteware. With only in-field analysis, it is very difficult to maintain a quantitative distinction in the amount of trachyte that must be present to make a Chuskan ware assignment, particularly if trachyte-tempered sherds were well ground before being used as tempering material themselves. Laboratory analysis is needed for this kind of accuracy in ware assignment. Nonetheless, the field analysis conducted here provides a baseline for future comparisons and should be comparable to other in-field analyses.

As Table 7.1 indicated earlier in this chapter, the Casamero area contains only a few sherds identified as nonlocal wares. Only one sherd each of Socorro Black-on-white, Sosi Black-on-white, and San Juan Redware were recorded in this area, in addition to eight sherds of White Mountain Redware. This is not an unusual pattern for the southern Chaco outliers (Mills 1986; Toll 1985:Table 7-2), or for other sites in the Red Mesa Valley (compare Gladwin 1945; Lang 1982). Even though Gladwin (1945) named an entire phase after the White Mountain Redware type of Wingate Black-on-red, sites dating to this phase in his scheme only had small amounts of this type. In contrast, the Pierre's complex contained relatively high percentages of nonlocal wares.

Ceramic Function and Assemblage Content

Functional Types - Classification of Vessels and Sites

Vessel form and surface treatment are two important functional variables of Southwestern ceramics. Even on surface surveys using in-field coding methods, attributes of both form and surface treatment may be consistently and accurately recorded.

The functional types used in this portion of the analysis were derived by combining attributes of both surface treatment and vessel form. Surface treatment attributes include slipped and unslipped, while the vessel form attributes include open (bowl) vs. closed (jar) forms. Only a small number of other forms or unknown forms were present in the sample, and these were excluded from the following analysis.

Using the above four attributes, four different functional types may be identified: 1) slipped bowls, 2) unslipped bowls, 3) slipped jars, and 4) unslipped jars. Of these four types, unslipped bowls are absent from the present assemblages. Thus, we are left with three functional classes.

In addition to functional types of ceramic vessels, the following analysis also looks at assemblage content among different site types. Site types for each of the sites with ceramics were constructed using a paradigmatic classification of feature content. Table 7.9 summarizes the dimensions and modes used to identify site types. As an example of how a site provenience might be assigned a site type through this Table 7.9 technique, consider a site with a room block, midden, and no other visible features. The first digit of the four digit number would be 2 for surface architecture present; the second digit would be 1 for subsurface architecture absent; the third digit would be 1 for midden present; and the last digit would be 1 for all other features absent.

Using only ceramic assemblages with 20 sherds or more, all of the proveniences were assigned a site type in the above described manner. Table 7.10 shows that only eight of the 32 possible combinations of attributes of the above four dimensions are present within the survey areas. Half of these eight site type classes are present at three sites or less. The remaining four classes contain seven or more site proveniences.

As Table 7.10 indicates, there are some slight differences between survey areas. In particular, we can see that Classes 1111, 1113, 1221, and 1223 occur almost exclusively in the Casamero area. What these classes all have in common is their lack of visible surface architecture. In contrast, Class 2111, with visible surface architecture but no subsurface architecture, midden, or other features, is only present in the Pierre's area.

Table 7.9. Dimensions and modes used in paradigmatic classification of site types.

Dimension	Mode	Description of Modal Value
I. Surface Architecture	1	Absent
	2	Present
II. Subsurface Architecture	1	Absent
	2	Present
III. Midden	1	Absent
	2	Present
IV. Other Surface Features	1	Absent
	2	Hearth
	3	Unburned Slab Feature
	4	Ash Stain

Site Type Class has four positions (I-IV). The first position refers to presence/absence of surface architecture, the second to the presence/absence of subsurface architecture (i.e., pitstructures, kivas, etc.), the third position to type of other surface features present. For example, Class 2121 has surface architecture, no pitstructures, definite midden area, and no other visible surface features.

Table 7.10. Table of site type class by survey area.

Site Type Class[a]	Area		Total
	Casamero	Pierre's	
1111	5	2	7
1113	3	0	3
1114	0	1	1
1221	3	0	3
1223	1	0	1
2111	0	7	7
2121	11	7	18
2221	12	5	17
Total	35	22	57

[a] Includes only those assemblages with 20 sherds or more.

```
Stem Leaf
  38 1
  36
  34 0
  32
  30
  28
  26 8
  24 7
  22 7759
  20 7
  18 112
  16 12366
  14 026701299
  12 004789
  10 80345699
   8 221157
   6 72258
   4 49
   2 8
   0 2
     ----+----+----+----+
     Multiply Stem.Leaf by 10**+1
```

Figure 7.4. Stem-and-leaf display of percentage of all bowls. Minimum ceramic assemblage size = 20. (From Harper et al. 1988:Figure 6.5)

```
Stem Leaf
   4 8
   4
   3 7788
   3 0224
   2 55566777899
   2 00111224
   1 5566677788999
   1 001122244
   0 5688
   0 023
     ----+----+----+----+
     Multiply Stem.Leaf by 10**+1
```

Figure 7.5. Stem-and-leaf display of percentage of all painted jars. Minimum ceramic assemblage size = 20. (From Harper et al. 1988:Figure 6.6.)

```
Stem Leaf
   9 9
   9 2
   8 68
   8 33
   7 89
   7 00111223444
   6 55667889
   6 00001222444
   5 678889
   5 00123334
   4 5
   4 34
   3 5
   3 3
     ----+----+----+----+
     Multiply Stem.Leaf by 10**+1
```

Figure 7.6. Stem-and-leaf display of all plainware jars. Minimum ceramic assemblage size = 20. (From Harper et al. 1988:Figure 6.7.)

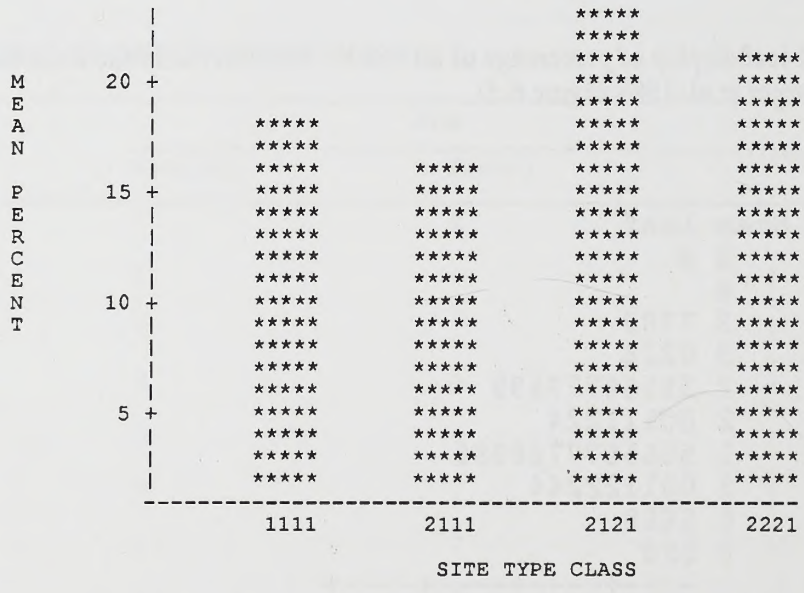

Figure 7.7. Mean percentages of painted jars by site type class. Both survey areas are included, using ceramic assemblages of 20 sherds or more. (N = number of assemblages in site type class. See Table 7.9 for explanation of site type class codes.) (From Harper et al. 1988:Figure 6.8.)

Analyses of Assemblage Content

The percentages of each of the three functional vessel classes were calculated for each assemblage having at least 20 sherds or more. Stem-and-leaf displays of the percentages of each class are shown in Figures 7.4 (all bowls), 7.5 (all painted jars), and 7.6 (all plainware jars). All three figures show the percentages by 1 percent increments, although in Figure 7.4 they are initially organized by 2 percent increments on the stem, and 1 percent on the leaf. For example, the 10 percent line shows one assemblage at 10.8 percent, one assemblage at 11.0 percent, one assemblage at 11.3 percent, etc. Somewhat surprisingly, all three of these distributions are roughly normal. Because there are no clear breaks in the distributions, they cannot be subdivided except arbitrarily. For this reason, the following analysis was set up to test differences in the percentages of the three functional classes across a number of other variables including survey sites, site class, and ceramic phase. Although the normal distributions thwart subdivision they do allow the use of parametric statistical tests. Because of the small sample sizes within some of the site classes shown in Table 7.10, when the following analysis considers these classes, only the four with the largest sample sizes are included.

Table 7.11 provides the summary statistics for each of the vessel classes by three different analysis variables: site type class, survey area, and phase. Considering first the site classes, we can see that the mean percentages of any one vessel class do not vary widely from site class to class. These relatively stable percentages are seen more easily in graphic form (Figures 7.7 through 7.9). Figure 7.7 shows the mean percentages of painted jars by site class, Figure 7.8 shows mean percentages of plainware jars by site class, while Figure 7.9 shows mean percentages of bowls by site class.

As the three illustrations show, plainware jars show the most stability, while the two painted forms show more fluctuations from site class to site class. An analysis of variance conducted on each of the vessel class percentages using site class as the dependent variable indicates that the observed variation among site classes is not significant.

The next variable considered was survey area. Side-by-side boxplots illustrate the differences in the percentages of each functional class within each survey area (Figure 7.10). Some contrasts are present between the two areas in that painted bowl percentages are higher in assemblages within the Pierre's area, while painted jar percentages are higher at Casamero. Plainware percentages appear roughly similar. The analysis of variance confirms that these visual trends are significant (Table 7.12); only plainware jars show no significant differences between survey areas. Because we are dealing with closed arrays here (i.e., percentage based data), then we know that if one variable is stable and one is changing, that the third variable must also change. In this case we do not yet know what is causing the change in painted jar and painted bowl percentages, but we do know that they are not independent of each other.

The final variable in the analysis was ceramic phase. The three phases of Early Pueblo II, Late Pueblo II, and Early Pueblo III were included (remembering that these are temporal equivalents to the Early, Classic, and Late Bonito Phases). Based on the summary statistics presented in Table 7.11, it appears that there may be more variation across phases than any of the other analysis variables. Specifically, the mean percentages of painted jars drops between each chronological phase, early to late, while plain jars increase. Bowls appear to be remarkably stable. The analysis of variance confirms that significant differences are present (Table 7.12) in the percentages of painted and

Table 7.11. Summary statistics for percentages of functional types of ceramics by analysis variables of survey area, site type class, and phase.

Analysis Variable		N	Min.	Max.	Mean	Std. Dev.
Site Type Class[a]						
1111	Painted Jars	4	6.02	32.32	19.77	11.94
	Plain Jars	4	52.94	85.96	70.09	16.88
	Bowls	3	7.23	15.00	12.31	4.40
2111	Painted Jars	7	4.55	21.82	14.81	6.66
	Plain Jars	7	50.00	72.73	63.57	9.58
	Bowls	7	5.36	35.00	18.56	9.05
2121	Painted Jars	18	7.69	47.75	22.43	11.52
	Plain Jars	18	35.14	83.22	62.61	12.21
	Bowls	17	7.22	23.91	13.73	4.30
2221	Painted Jars	15	10.57	37.60	21.20	7.99
	Plain Jars	15	43.20	78.05	60.81	9.48
	Bowls	15	8.16	26.81	15.88	5.70
Survey Area						
Casamero	Painted Jars	23	8.00	47.75	26.78	9.06
	Plain Jars	23	35.14	79.00	58.20	10.27
	Bowls	22	7.22	23.91	13.89	3.95
Pierre's	Painted Jars	21	4.55	21.82	13.74	4.86
	Plain Jars	21	50.00	86.96	67.90	10.30
	Bowls	20	5.36	35.00	16.64	7.33
Phase						
Early	Painted Jars	11	8.00	47.75	29.62	10.04
Pueblo II	Plain Jars	11	35.14	79.00	55.08	11.66
	Bowls	11	9.09	19.20	14.12	3.03
Late	Painted Jars	25	7.69	37.93	19.57	7.55
Pueblo II	Plain Jars	25	44.83	85.96	63.62	10.12
	Bowls	23	5.36	35.00	15.81	6.96
Early	Painted Jars	8	4.55	16.55	11.18	4.42
Pueblo III	Plain Jars	8	54.11	83.13	70.99	8.00
	Bowls	8	7.23	24.66	14.92	5.96

[a] See Table 7.9 for explanation of site type class codes.

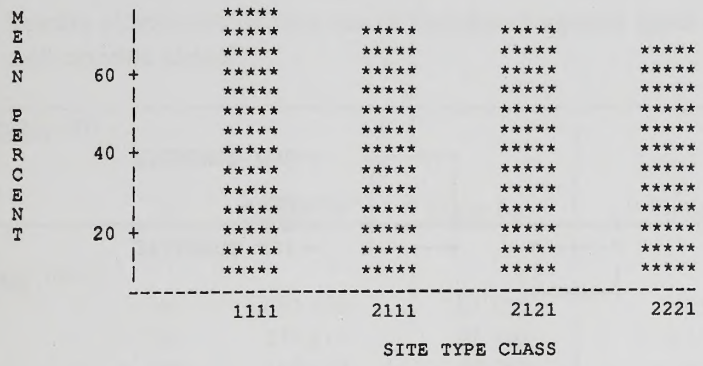

Figure 7.8. Mean percentages of plainware jars by site type class. Both survey areas are included, using ceramic assemblages of 20 sherds or more. (N = number of assemblages in site type class. See Table 7.9 for explanation of site type class codes.) (From Harper et al. 1988:Figure 6.9.)

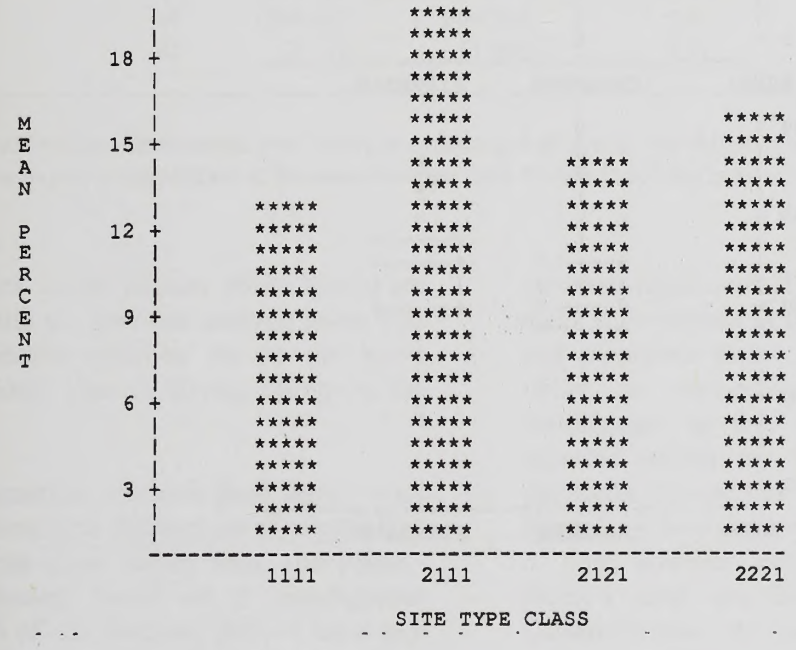

Figure 7.9. Mean percentage of bowls by site type class. Both survey areas are included, using ceramic assemblages of 20 sherds or more. (N = number of assemblages in site type class. See Table 7.9 for explanation of site type class codes.) (From Harper et al. 1988:Figure 6.10.)

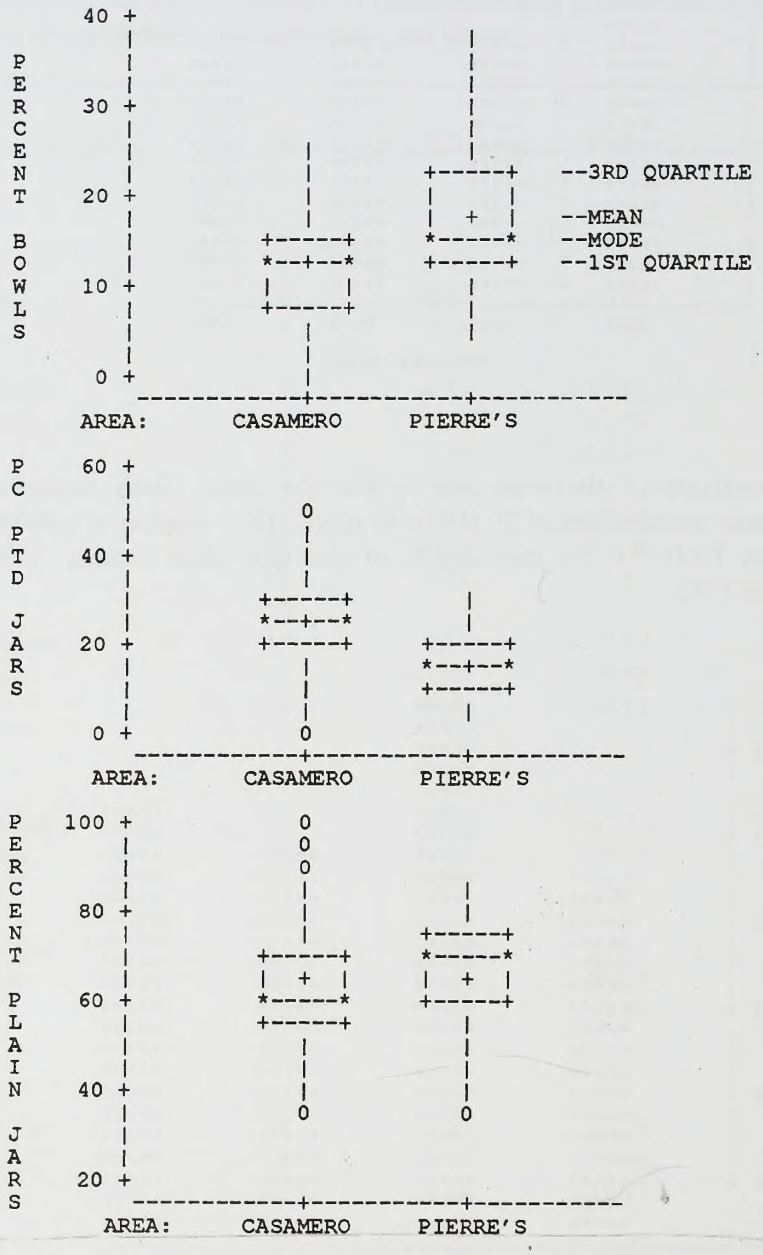

Figure 7.10. Side-by-side boxplots of percentages of bowls, painted jars, and plainware jars by survey areas. Mean, mode, and quartile symbols shown at upper right apply to all figures. (From Harper et al. 1988:Figure 6.11.)

Table 7.12. Results of analyses of variance of functional ceramic types and site type class, survey area, and ceramic phase.

Analysis Variable (df) Dependent Variable	N	Anova SS	Mean Sq.	F Value	Pr > F	R-Sq
Site Type Class (df=3)						
Painted jars	44	303.498	101.166	1.05	0.380	0.073
Plain jars	44	276.918	92.306	0.71	0.552	0.051
Bowls	42	147.849	49.283	1.46	0.240	0.104
Area (df=1)						
Painted jars	44	1867.528	1867.528	34.44	0.0001	0.451[a]
Plain jars	44	1032.043	1032.043	9.76	0.0032	0.189[a]
Bowls	42	79.745	79.745	2.37	0.1319	0.056
Phase (df=2)						
Painted jars	44	1631.810	815.905	13.31	0.0001	0.394[a]
Plain jars	44	1208.669	604.334	5.81	0.0060	0.221[a]
Bowls	42	22.170	11.085	0.31	0.7370	0.016

[a] Significant differences between analysis variables present at 0.05 level. For differences between phases using plain jar percentages, no significant differences between Late Pueblo II and Early Pueblo III.

plainware jars across phases, while bowls are stable. As with the previous analysis using area as the dependent variable, we do not know which functional class is driving change in the other.

To summarize, we have used three vessel classes to investigate differences in assemblage content by site class, survey area, and phase. The site classes, based on a paradigmatic classification of site features, did not show any internal differentiation by functional assemblage attributes. In other words, there does not appear to be any direct relationship between assemblage content and feature content. In contrast, significant differences between survey areas were present in the percentages of painted and plainware jars. Painted jars are almost twice as numerous in Casamero area assemblages as they are in the assemblages sampled within the Pierre's complex, while plainware jars appear in higher percentages at Pierre's. These differences are not independent of time, however, because assemblages in the Pierre's area are later than those in the Casamero area. As the analysis of variance by phase indicated, there is a trend toward increasing percentages of plainware jars and a correlative decrease in the percentage of painted jars through time.

Conclusions

Three primary research topics were addressed with the data collected during the inventory survey: chronology, trade, and assemblage content. Each of these topics is summarized below.

Chronological analyses were conducted using sequences of stylistic change in each of the major ware categories. Mean ceramic dates and ceramic groups were used to assign each assemblage to a ceramic phase. The ceramic phase intervals follow those of National Park Service researchers (McKenna and Toll 1984; Toll et al. 1980; Windes 1984), whose extensive research on ceramic chronology in Chaco Canyon provides a firm basis for comparison. Their Early, Classic and Late Bonito Phases are equivalent in both definition and duration to the Early Pueblo II (A.D. 920 to 1020), Late Pueblo II (A.D. 1020 to 1120), and Early Pueblo III (A.D. 1120 to 1220) ceramic phases used in this report.

The results of the chronological analyses indicated that the earliest ceramic site in the Casamero area is a large Basketmaker III component located on the top of Tecolote Mesa. No sites with Pueblo I ceramic assemblages were recorded within the Casamero survey area. The Casamero community has a strong Early Pueblo II occupation, which is ceramically dominated by Red Mesa style whitewares. Use of the area picks up dramatically in the middle of the tenth century (Early Pueblo II and Early Bonito Phase) and continues through the middle eleventh century (Late Pueblo II or Classic Bonito Phase). Sites of the latter phase are dominated by Gallup style whitewares. The dating of the great house of Casamero itself was corroborated through reanalysis of subsurface collections made by Cottonwood Gulch Foundation now curated by the Maxwell Museum of Anthropology.

The Pierre's area also has a low frequency of Basketmaker III remains, but its principal time of use was during the Late Pueblo II and Early Pueblo III phases. In contrast to the Casamero area, the Pierre's complex contains no tenth century assemblages. Puebloan occupation in the Pierre's area appears to have resumed in the middle eleventh century, or the Late Pueblo II (Classic Bonito) Phase. This finding is a significant one for understanding the relationship of Pierre's to the chronology of sites in Chaco Canyon because it demon-strates first substantial use of the Pierre's complex at the same time as construction at Pueblo Alto (to which it is physically connected via road networks), as well as the peak construction of most of the large structures in the canyon itself. Use of the Pierre's area was equally strong during the Early Pueblo III (Late Bonito) Phase, reflecting a well-known trend for northern outliers to have been used at the end of, and even persisting after, the major period of construction in the central canyon.

Evidence for trade and exchange was investigated through the relative frequencies of ceramic wares. Using the assumption that Cibola Grayware and Cibola Whiteware were locally produced while all other wares were produced outside the two survey areas, differences in the relative amounts of nonlocal to local ceramics between the two areas was demonstrated.

The Casamero community assemblages contained relatively few nonlocal ceramics. Those that were present were principally White Mountain Redware. This is not a new observation; it has long been known that southern Chaco outliers generally contain fewer trade wares than do northern and western outliers. The focus of trade (if so few trade wares may even indicate a focus) was to the south, where White Mountain Redwares were produced. Because of the large area of White

Mountain Redware production, however, it is not possible to say any more precisely where these ceramics were coming from.

In contrast, the Pierre's complex assemblage contains relatively more abundant nonlocal ceramics. During the Late Pueblo II (Classic Bonito Phase), nonlocal ceramics comprised 12 percent of the plainware assemblages and 13 percent of the painted assemblages. These figures both rise during the following Early Pueblo III (Late Bonito) Phase. Nonlocal ceramics were dominated by Chuskan types within both time periods and within both painted and plainware assemblages.

Although intrasite variation in nonlocal ceramics within the Pierre's complex is present, this variation does not appear to be congruent with morphological similarities. The large great house on the valley floor next to El Faro (LA 16515) contained very low percentages of nonlocal ceramics, while the two trash areas associated with the great houses on the "Acropolis" had much higher nonlocal percentages. The site with the highest nonlocal ceramics was a relatively small structural site (LA 16521) with an associated kiva. Some of this variation may be temporal, however, because LA 16515 appears to date slightly earlier than these latter sites, and as was noted above, there is an apparent increase in the quantity of nonlocal ceramics from the Classic to Late Bonito Phase.

In a regional context, it was shown that the Pierre's complex has slightly higher percentages of Chuskan ceramics than might be expected using a distance-decay model from the presumed source of the Chuska Mountains. While we might expect higher than expected frequencies at sites in proximity to Chaco roads connecting the Chuskas to other sites in the regional system, the Great North Road is not connected to the Chuskas in this way, Chuska ceramics therefore must have either passed through Chaco Canyon or the San Juan area first (areas connected to the Pierre's complex via roads), or the distribution of Chuskan ceramics was not along the road itself. If the latter, then this certainly has implications for how we think about Chaco roads. If they were not for exchange, what were they for? Elsewhere Mills 1986) the argument has been made that the presence of nonlocal ceramics may indicate either primary (where goods moved from source to people) or secondary (an embedded strategy whereby people go to the source to procure goods as part of some other activity) distribution. Which one of these was present may have a significant effect on models of ceramic trade and exchange in the San Juan Basin. Until we can develop expectations for each possibility, the nature and role of exchange in the Chaco system remains only partially understood.

The final research topic investigated was variation in functional attributes among assemblages that might suggest differences in site use. This topic was pursued by using the three general surface treatment/vessel form categories: painted bowls, painted jars, and plainware jars. As with the analysis of nonlocal ceramics, functional classes did not appear to covary with morphological classes of sites.

Significant differences were present, however, in the analysis of assemblage content by survey area and time period. The Pierre's area assemblage had significantly higher painted bowl percentages than the Casamero area, an interesting result given that this area also has more nonlocal painted ceramics. Because most of the nonlocal painted ceramics are bowls, the higher percentages of bowls in the Pierre's area may be related to the relative ease of transporting bowls over jars. But, because nonlocal plainware jars were also clearly transported from their probable production area,

it cannot be assumed that ease of transport was the only consideration, only that this may be a factor in the painted bowl assemblages.

Change through time in assemblage content was also demonstrated in that the painted jar percentages continually dropped in each of the three major phases. Plainware jar percentages correlatively increased through time. This trend suggests some change in discard behavior. Either plainware jar uselives were becoming shorter, or painted jar uselives were becoming longer. Shorter or longer uselives are nearly always related to differences in the frequency of use, although other factors may certainly intervene. Unfortunately, we do not know whether the apparent increase in plainware jar percentages was because of the absolute increases in the use of this vessel class, or whether it is a product of decreasing use of painted jars.

In summary, the ceramic analysis has posed more questions than answers. Although a basic chronological framework was presented for each area, we still do not know very much about duration of occupation, and therefore we also do not know about the true contemporaneity of the use of sites in each area. We still need substantial research investment in ceramic production and distribution patterns, particularly in mineralogical and chemical composition–analyses that cannot be performed in the field. And finally, we are only beginning to understand some of the differences in assemblage content. Further analyses of this type need to be done at a regional level in order to form a more solid basis for comparison.

CHAPTER 8

LITHIC ANALYSIS AND RESULTS[1]

James M. Brandi

Introduction

The purpose of this analysis is to examine, for comparative purposes, material and lithic types recorded at two Chacoan outliers and their immediate vicinities. This analysis will provide 1) a list by site of lithic and material types, 2) a list of material types by time period for each area, 3) a list of exotic material types and their frequency by time period for each area, and 4) a list of lithic artifact class and material type variability for each area.

Previous research at Casamero Pueblo and the Pierre's Complex has identified these two outliers as being part of an overall road/exchange network associated with Chaco Canyon. Many outlier sites appear to be located near source areas for exotic resources (exchange items) that have been found at sites in Chaco Canyon. Present evidence suggests that most of these resources (exchange items) were consumed in Chaco Canyon and not redistributed elsewhere (Cameron 1984; Powers 1984a).

This project resulted not only in an intensive survey of the outliers but included their surrounding areas as well. The lithic material type data recovered from the survey and presented here will add to the database of Chaco outliers and their communities and the role they may have had in the overall Chaco phenomenon.

Definitions

Material types were coded in the field using a four digit classification developed by A. H. Warren (1967, 1977). Ninety-two material types were recorded. For purposes of analysis, these types were grouped into 25 general material types using Jacobson's (1984) material groups as a general rule. Table 8.1 lists the material groups and their inclusive material type codes. A complete list of material types recorded during the survey, along with their codes and description is listed in Harper et al. (1988:Appendix 3). Site by site lists of artifact types and materials can be found in Harper et al. (1988:Appendix 4).

There exists a potential for misclassification when using A. H. Warren's codes for the purpose of in-field analysis. Some material types necessitate microscopic analysis to determine their proper classification or source. The Office of Contract Archeology type collection was studied prior to fieldwork to eliminate misclassification.

A definition of artifact types recorded in the field is listed below (Table 8.2). Because the analysis concentrated primarily on material type identification (as specified by the Bureau of Land Management survey stipulations), some artifact types that were recorded in the field were grouped into general categories for purposes of analysis.

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[1]This chapter initially appeared as Chapter 7 in Harper et al. (1988).

Table 8.1. Lithic material groups.

Material Description	Code Numbers
Fossiliferous chert	1010, 1011, 1014, 1016
High surface cherts and chalcedonies	1050, 1051, 1052, 1053, 1054
Miscellaneous chert	1021, 1030, 1041, 1042, 1044, 1046, 1057, 1060, 1070, 1075, 1400, 1425, 1600, 1602, 1610, 1620, 1630, 1650, 1660, 1661, 1680
Miscellaneous chalcedony	1200, 1201, 1210, 1212, 1214, 1215, 1221, 1230, 1231, 1235, 1300, 1310, 1320, 1345
Miscellaneous Morrison Formation chert	1020, 1022, 1434
Brushy Basin chert	1040
Chinle chert	1072
Pedernal chert	1090
Narbona (Washington) Pass chert	1080
Miscellaneous petrified wood	1100, 1105, 1111, 1120, 1130
Petrified wood, non-conchoidal	1109, 1110
Petrified wood, conchoidal	1112, 1113, 1150
Petrified wood, chalcedonic	1140, 1142
Petrified wood, Zuni	1160, 1161
Miscellaneous sandstone	2000, 2042, 2050, 2080
Quartzitic sandstone	2200
Miscellaneous siltstone	2250, 2252
Claystone	2551
Limestone, undifferentiated	2700
Miscellaneous obsidian	3500, 3502, 3506, 3527
Grants obsidian	3510
Jemez obsidian	3520, 3523
Red Hill obsidian	3550
Quartzite, undifferentiated	4000
Other	3350, 4250, 5000, 5110, 5320, 5330, 3404, 3400, 3451

Table 8.2. Artifact types.

Type	Description
Angular debris	Angular debris is a piece of debitage that exhibits no definable ventral surface. It does, however, exhibit conchoidal fractures indicative of the percussion method of tool manufacture.
Flake	A flake is a piece of debitage that exhibits definable ventral and dorsal surfaces. The ventral surface is the last surface attached to the larger rock from which the flake was removed. This category includes primary, secondary, tertiary, and thinning flakes.
Retouched	Any piece of debitage with one or more edges exhibiting regular scars (resulting from deliberate edge modification) that extend 2 mm or farther from the edge.
Uniface/Scraper	A uniface/scraper exhibits retouch over one-third or more of one surface of the artifact.
Biface/Knife	A biface/knife exhibits retouch over one-third or more of both surfaces of the artifact.
Projectile point	Projectile points are generally produced through bifacial production. Their overall morphology is characterized by a point and two expanding lateral sides. Bases are shaped to facilitate hafting. Included in this category and recorded in the field were side-notched and corner-notched projectile points.
Other flaked tools	This category includes drill/gravers and spokeshaves. Drill/gravers exhibit bifacial retouch or extensive marginal retouching aimed toward producing a projection and a handle. Spokeshaves are characterized by the presence of a concave, steep edge-angle notch on one edge of a flake or piece of angular debris.
Cores	Cores are defined as pieces of raw material exhibiting negative scars two or more centimeters in length which originate from one or more platforms. This category includes unidirectional, bidirectional, and irregular cores.
Hammerstone/Maul	A hammerstone/maul is a cobble or exhausted core that exhibits battering on one or both end/sides.
Groundstone	Groundstone is characterized as a stone artifact that exhibits intentional grinding that results in a concave, flat, or convex surface. This category includes indeterminate groundstone fragments, indeterminate mano fragments, one-hand manos, two-hand manos, indeterminate metate fragments, slab metates, basin metates, and trough metates.
Miscellaneous	This category includes artifacts that were recorded as tested rocks, anvil stones, pendants and pendant blanks, polishing stones, and shaped pot covers.

Table 8.3. Casamero lithic artifact class and material type variability.

	Artifact Class											
	Angular Debris		Flakes		Retouched		Uniface/scraper		Bifaces		Projectile points	
Material	N	%	N	%	N	%	N	%	N	%	N	%
Fossiliferous chert	24	12.6	153	80.5	3	1.6	4	2.1	1	0.5	-	-
High surface cherts/chalcedony	5	14.7	26	76.5	-	-	2	5.9	-	-	1	2.9
Misc. cherts	19	17.1	82	73.9	1	0.9	5	4.4	-	-	1	0.9
Misc. chalcedony	14	10.9	51	76.1	-	-	1	1.5	-	-	-	-
Misc. Morrison Formation chert	4	14.2	21	75.0	1	3.6	-	-	-	-	-	-
Brushy Basin chert	11	64.7	35.3	-	-	-	-	-	-	-	-	-
Chert (Chinle)	13	9.7	110	82.1	1	0.7	2	1.5	1	0.7	1	0.7
Pedernal chert	1	50.0	1	50.0	-	-	-	-	-	-	-	-
Narbona (Washington) Pass chert	-	-	2	100	-	-	-	-	-	-	-	-
Misc. petrified wood	12	38.7	16	51.6	1	3.2	-	-	1	3.2	-	-
Zuni petrified wood	3	15.8	15	78.9	-	-	-	-	-	-	-	-
Non-conchoidal petrified wood	66	76.0	14	15.9	1	2.2	-	-	-	-	-	-
Conchoidal petrified wood	11	27.5	27	67.5	-	-	-	-	-	-	-	-
Chalcedonic petrified wood	4	21.1	12	63.2	-	-	-	-	-	-	-	-
Misc. sandstone	-	-	1	0.3	-	-	-	-	-	-	-	-
Quartzitic sandstone	8	13.6	17	28.8	1	1.7	-	-	-	-	-	-
Misc. siltstone	3	33.3	2	22.2	-	-	-	-	-	-	-	-
Claystone undifferentiated	14	82.4	3	17.6	-	-	-	-	-	-	-	-
Limestone undifferentiated	11	4.9	144	64.0	3	1.3	3	1.3	-	-	-	-
Misc. obsidian	-	-	4	80.0	-	-	-	-	-	-	1	20.0
Grants obsidian	2	100	-	-	-	-	-	-	-	-	-	-
Jemez obsidian	-	-	3	75.0	-	-	-	-	-	-	1	25.0
Quartzite	12	25.5	29	61.7	-	-	-	-	-	-	-	-
Other	5	29.4	3	17.6	-	-	-	-	-	-	-	-
Total	242	15.9	742	48.8	12	0.8	17	1.1	3	0.2	5	0.3

Table 8.3. Continued.

Material	Artifact Class: Other flake tools N	Other flake tools %	Cores N	Cores %	Hammer-stones N	Hammer-stones %	Groundstone N	Groundstone %	Miscel-lancous N	Miscel-lancous %	Material Totals N	Material Totals %
Fossiliferous chert	1	0.5	3	1.6	-	-	-	-	1	0.5	190	12.5
High surface cherts/chalcedony	-	-	-	-	-	-	-	-	-	-	34	2.2
Misc. cherts	-	-	3	2.7	-	-	-	-	-	-	111	7.3
Misc. chalcedony	-	-	1	1.5	-	-	-	-	-	-	67	4.4
Misc. Morrison Formation chert	-	-	1	3.6	1	3.6	-	-	-	-	28	1.8
Brushy Basin chert	-	-	-	-	-	-	-	-	-	-	17	1.1
Chert (Chinle)	-	-	6	4.5	-	-	-	-	-	-	134	8.8
Pedernal chert	-	-	-	-	-	-	-	-	-	-	2	0.1
Narbona (Washington) Pass chert	-	-	-	-	-	-	-	-	-	-	2	0.1
Misc. petrified wood	1	3.2	-	-	-	-	-	-	-	-	31	2.0
Zuni petrified wood	1	5.3	-	-	-	-	-	-	-	-	19	1.2
Non-conchoidal petrified wood	-	-	2	2.3	5	5.7	-	-	-	-	88	5.8
Conchoidal petrified wood	-	-	1	2.5	1	2.5	-	-	-	-	40	2.6
Chalcedonic petrified wood	-	-	3	15.8	-	-	-	-	-	-	19	1.2
Misc. sandstone	-	-	-	-	-	-	353	99.7	-	-	354	23.3
Quartzitic sandstone	-	-	-	-	2	3.4	30	50.8	1	1.7	59	3.9
Misc. siltstone	-	-	-	-	-	-	-	-	4	44.4	9	0.6
Claystone undifferentiated	-	-	-	-	-	-	-	-	-	-	17	1.1
Limestone undifferentiated	-	-	26	11.6	10	4.4	13	5.8	15	6.7	225	14.8
Misc. obsidian	-	-	-	-	-	-	-	-	-	-		0.3
Grants obsidian	-	-	-	-	-	-	-	-	-	-	2	0.1
Jemez obsidian	-	-	-	-	-	-	-	-	-	-	4	0.3
Quartzite	-	-	1	2.1	3	6.4	1	2.1	1	2.1	47	3.1
Other	-	-	-	-	-	-	7	41.2	2	11.8	17	1.1
Total	3	0.2	47	3.1	22	1.4	404	26.6	24	1.6	1,521	100.0

Table 8.4. Pierre's lithic artifact class and material type variability.

	Artifact Class											
	Angular Debris		Flakes		Retouched		Uniface/scraper		Bifaces		Projectile points	
Material	N	%	N	%	N	%	N	%	N	%	N	%
Fossiliferous chert	5	2.5	128	65.0	1	0.5	-	-	-	-	-	-
High surface cherts/chalcedony	-	-	26	92.9	-	-	-	-	-	-	-	-
Misc. cherts	2	5.9	27	79.4	-	-	-	-	1	2.9	-	-
Misc. chalcedony	-	-	43	91.5	-	-	-	-	-	-	2	4.3
Misc. Morrison Formation chert	-	-	1	33.3	-	-	-	-	-	-	-	-
Brushy Basin chert	-	-	1	100	-	-	-	-	-	-	-	-
Chert (Chinle)	-	-	15	71.4	1	4.8	-	-	-	-	-	-
Narbona (Washington) Pass chert	-	-	1	50.0	-	-	-	-	-	-	-	-
Misc. petrified wood	1	5.3	17	89.5	-	-	-	-	-	-	-	-
Zuni petrified wood	-	-	9	90.0	1	10.0	-	-	-	-	-	-
Non-conchoidal petrified wood	49	22.6	134	61.8	-	-	-	-	-	-	-	-
Conchoidal petrified wood	14	6.0	184	79.0	4	1.7	1	0.4	4	1.7	-	-
Chalcedonic petrified wood	11	3.4	277	86.0	11	3.4	1	0.3	-	-	3	0.9
Misc. sandstone	-	-	-	-	-	-	-	-	-	-	-	-
Quartzitic sandstone	1	2.5	22	55.0	-	-	-	-	-	-	-	-
Misc. siltstone	-	-	1	100	-	-	-	-	-	-	-	-
Claystone undifferentiated	18	54.5	15	45.5	-	-	-	-	-	-	-	-
Misc. obsidian	-	-	4	100	-	-	-	-	-	-	-	-
Jemez obsidian	-	-	1	50.0	1	50.0	-	-	-	-	-	-
Red Hill obsidian	1	100	-	-	-	-	-	-	-	-	-	-
Quartzite	2	1.9	41	38.7	1	0.9	-	-	-	-	-	-
Other	-	-	1	100	-	-	-	-	-	-	-	-
Total	104	7.4	948	67.2	20	1.4	2	0.1	5	0.4	5	0.4

Table 8.4. Continued.

	Artifact Class											
	Other flake tools		Cores		Hammer-stones		Groundstone		Miscel-laneous		Material Totals	
Material	N	%	N	%	N	%	N	%	N	%	N	%
Fossiliferous chert	-	-	24	12.2	7	3.6	-	-	32	16.2	197	14.0
High surface cherts/chalcedony	-	-	1	3.6	1	3.6	-	-	-	-	28	2.0
Misc. cherts	-	-	2	5.9	1	2.9	-	-	1	2.9	34	2.4
Misc. chalcedony	-	-	2	4.3	-	-	-	-	-	-	47	3.3
Misc. Morrison Formation chert	-	-	1	33.3	-	-	-	-	1	33.3	3	0.2
Brushy Basin chert	-	-	-	-	-	-	-	-	-	-	1	0.1
Chert (Chinle)	-	-	5	23.8	-	-	-	-	-	-	21	1.5
Narbona (Washington) Pass chert	-	-	-	-	-	-	-	-	1	50.0	2	0.1
Misc. petrified wood	-	-	-	-	-	-	-	-	1	5.3	19	1.3
Zuni petrified wood	-	-	-	-	-	-	-	-	-	-	10	0.7
Non-conchoidal petrified wood	-	-	3	1.4	25	11.5	1	0.5	5	2.3	217	15.4
Conchoidal petrified wood	1	0.4	21	9.0	3	1.3	-	-	1	0.4	233	16.5
Chalcedonic petrified wood	-	-	17	5.3	-	-	1	0.3	1	0.3	322	22.8
Misc. sandstone	-	-	-	-	-	-	89	100	-	-	89	6.3
Quartzitic sandstone	-	-	1	2.5	2	5.0	13	32.5	1	2.5	40	2.8
Misc. siltstone	-	-	-	-	-	-	-	-	-	-	1	0.1
Claystone undifferentiated	-	-	-	-	-	-	-	-	-	-	33	2.3
Misc. obsidian	-	-	-	-	-	-	-	-	-	-	4	0.3
Jemez obsidian	-	-	-	-	-	-	-	-	-	-	2	0.1
Red Hill obsidian	-	-	-	-	-	-	-	-	-	-	1	0.1
Quartzite	-	-	2	1.9	28	26.4	20	18.9	12	11.3	106	7.5
Other	-	-	-	-	-	-	-	-	-	-	1	0.1
Total	1	0.1	79	5.6	67	4.7	124	8.8	56	4.0	1,411	100.0

Table 8.5. Casamero survey data: Grouped materials by area and time period.

Material	Basketmaker III		Early Pueblo II		Late Pueblo II		Unidentified Pueblo II-III	
	N	%	N	%	N	%	N	%
Fossiliferous chert	3	6.2500	106	18.1818	79	9.5758	2	3.0769
High surface cherts/chalcedony	1	2.0833	22	3.7736	10	1.2121	1	1.5385
Misc. cherts	12	25.0000	65	11.1492	33	4.0000	1	1.5385
Misc. chalcedony	4	8.333	43	7.3756	20	2.4242	-	-
Misc. Morrison Formation chert	-	-	17	2.9160	10	1.2121	1	1.5385
Brushy Basin chert	-	-	4	0.6861	13	1.5758	-	-
Chert (Chinle)	3	6.2500	8	1.3722	122	14.7879	1	1.5385
Pedernal chert	-	-	2	0.3431	-	-	-	-
Narbona (Washington) Pass chert	-	-	2	0.3431	-	-	-	-
Misc. petrified wood	4	8.3333	20	3.4305	5	0.6061	2	3.0769
Zuni petrified wood	-	-	11	1.8868	8	0.9697	-	-
Non-conchoidal petrified wood	1	2.0833	24	4.1166	59	7.1515	4	6.1538
Conchoidal petrified wood	6	12.5000	15	2.5729	18	2.1818	1	1.5385
Chalcedonic petrified wood	-	-	15	2.5729	3	0.3636	1	1.5385
Misc. sandstone	6	12.5000	121	20.7547	202	24.4848	25	38.4615
Quartzitic sandstone	1	2.0833	16	2.7444	41	4.9697	1	1.5385
Misc. siltstone	-	-	-	-	9	1.0909	-	-
Claystone undifferentiated	-	-	5	0.8576	12	1.4545	-	-
Limestone undifferentiated	5	10.4167	58	9.9485	139	16.8485	23	35.3846
Misc. obsidian	-	-	3	0.5146	2	0.2424	-	1.5385
Grants obsidian	1	2.0833	1	0.1715	-	-	-	-
Jemez obsidian	-	-	2	0.3431	2	0.2424	-	-
Red Hill obsidian	-	-	-	-	-	-	-	-
Quartzite	1	2.0833	17	2.9160	28	3.3939	1	1.5385
Other	-	-	6	1.0292	10	1.2121	1	1.5385
Total/Period	48		583		825		65	

Table 8.6. Pierre's survey data: Grouped materials by area and time period.

Material	Basketmaker III-Pueblo I		Unidentified Pueblo II-III		Early Pueblo III		Unidentified Pueblo III		Gobernador		Navajo		Aceramic	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Fossiliferous chert	139	20.5926	4	4.0816	50	12.9199	1	33.3333	-	-	2	2.7397	1	0.6623
High surface cherts/chalcedony	1	0.1481	1	1.0204	2	0.5168	-	-	-	-	3	4.1096	21	13.9073
Misc. cherts	17	2.5185	1	1.0204	8	2.0672	-	-	-	-	2	2.7397	6	3.9735
Misc. chalcedony	19	2.8148	1	1.0204	11	2.8424	1	33.3333	1	4.3478	2	2.7397	12	7.9470
Misc. Morrison Formation chert	1	0.1481	-	-	-	-	-	-	-	-	-	-	2	1.3245
Brushy Basin chert	-	-	-	-	-	-	-	-	-	-	1	1.3699	-	-
Chert (Chinle)	13	1.9259	-	-	7	1.8088	-	-	-	-	1	1.3699	-	-
Pedernal chert	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Narbona (Washington) Pass chert	2	0.2963	-	-	-	-	-	-	-	-	-	-	-	-
Misc. petrified wood	7	1.0370	3	3.0612	3	0.7752	-	-	1	4.3478	2	2.7397	3	1.9868
Zuni petrified wood	1	0.1481	-	-	-	-	-	-	-	-	-	-	9	5.9603
Non-conchoidal petrified wood	150	22.2222	8	8.1633	45	11.6279	-	-	-	-	5	6.8493	9	5.9603
Conchoidal petrified wood	95	14.0741	17	17.3469	83	21.4470	-	-	6	26.0870	6	8.2192	26	17.2185
Chalcedonic petrified wood	74	10.9630	50	51.0204	109	28.1654	1	33.3333	9	39.1304	35	47.9452	43	28.4768
Misc. sandstone	42	6.2222	1	1.0204	29	7.4935	-	-	4	17.3913	8	10.9589	5	3.3113
Quartzitic sandstone	17	2.5185	4	4.0816	16	4.1344	-	-	1	4.3478	-	-	2	1.3245
Misc. siltstone	1	0.1481	-	-	-	-	-	-	-	-	-	-	-	-
Claystone undifferentiated	28	4.1481	-	-	4	1.0336	-	-	-	-	1	1.3699	-	-
Limestone undifferentiated	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. obsidian	1	0.1481	-	-	-	-	-	-	-	-	1	1.3699	2	1.3245
Grants obsidian	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Jemez obsidian	-	-	-	-	-	-	-	-	-	-	-	-	2	1.3245
Red Hill obsidian	1	0.1481	-	-	-	-	-	-	-	-	-	-	-	-
Quartzite	65	9.6296	8	8.1633	20	5.1680	-	-	1	4.3478	4	5.4795	8	5.2980
Other	1	0.1481	-	-	-	-	-	-	-	-	-	-	-	
Total/Period	675		98		387		3		23		73		151	

Table 8.7. Casamero survey: Exotic material frequencies by time period.

		Basketmaker III (Pre A.D. 720)		Early Pueblo II (AD 920-1020)		Late Pueblo II (AD 1020-1120)	
Material Type	Code	Count	Percent	Count	Percent	Count	Percent
Brushy Basin chert	1040	-	-	-	-	-	-
Chert (Chinle)	1072	-	-	-	-	-	-
Pedernal chert	1090	-	-	2	9.5	-	-
Narbona (Washington) Pass chert	1080	-	-	2	9.5	-	-
Zuni petrified wood	1160	-	-	11	52.4	8	66.6
Undifferentiated obsidian	3500	-	-	2	9.5	2	16.7
Undifferentiated obsidian	3502	-	-	1	4.8	-	-
Grants obsidian	3510	1	100	1	4.8	-	-
Jemez obsidian	3523	-	-	2	9.5	2	16.7
Red Hill obsidian	3550	-	-	-	-	-	-
Total		1		21		12	

These groupings are noted under the general artifact category. Definitions have been modified from the GBFELTIE Testing Program (Schutt et al. 1988).

Results

One of the objectives of this analysis is to discern any similarities or differences between the Casamero and Pierre's survey areas. Tables 8.3 through 8.8 are presented and discussed below.

Tables 8.3 and 8.4 list lithic artifact type by material type from the Casamero and Pierre's survey areas. Flakes and groundstone are the most common artifact types recorded at each area. Hammerstones and uniface/scrapers are the most dominant tool types at Casamero, while at Pierre's, hammerstones are the most frequent tool type recorded.

Two discernable differences between the Casamero survey area and that of Pierre's with regard to artifact type were noted. Groundstone artifacts comprised 26.6 percent of the total artifact assemblage at Casamero whereas at Pierre's, groundstone artifacts comprised only 8.8 percent of the total assemblage. Hammerstones in the Casamero area only comprised 1.4 percent of the total artifact assemblage while at Pierre's, hammerstones totaled 4.7 percent of the total assemblage.

Tables 8.5 and 8.6 list general material types and their frequency by time period as recorded from the Casamero and Pierre's survey areas. At Casamero, miscellaneous cherts show the highest frequency during the Basketmaker III time period (though only one site is represented).

Table 8.8. Pierre's survey: Exotic material frequencies by time period.

Material Type	Code	Late Pueblo II (AD 1020-1120)		Early Pueblo III (AD 1120-1220)		Navajo (19th-20th centuries)		Aceramic	
		Count	Percent	Count	Percent	Count	Percent	Count	Percent
Brushy Basin chert	1040	-	-	-	-	1	33.3	-	-
Chert (Chinle)	1072	13	72.2	7	100	1	33.3	-	-
Pedernal chert	1090	-	-	-	-	-	-	-	-
Narbona (Washington) Pass chert	1080	2	11.0	-	-	-	-	-	-
Zuni petrified wood	1160	1	5.6	-	-	-	-	7	53.8
Zuni petrified wood	1161	0	-	-	-	-	-	2	15.4
Undifferentiated obsidian	3500	1	5.6	-	-	-	-	1	7.7
Undifferentiated obsidian	3502	-	-	-	-	-	-	-	-
Undifferentiated obsidian	3506	-	-	-	-	1	33.3	-	-
Undifferentiated obsidian	3527	-	-	-	-	-	-	1	7.7
Grants obsidian	3510	-	-	-	-	-	-	-	-
Jemez obsidian	3523	-	-	-	-	-	-	2	15.4
Red Hill obsidian	3550	1	5.6	-	-	-	-	-	-
Total		18		7		3		13	

Fossiliferous chert and miscellaneous sandstone have the highest frequency for the Early Pueblo II period and miscellaneous sandstone, undifferentiated limestone, and Chinle chert have the highest frequencies for the Late Pueblo II period. Fossiliferous chert and various petrified woods show the highest frequency on Late Pueblo II and Early Pueblo III sites at Pierre's while high surface cherts/chalcedonies and various petrified woods dominate the frequencies at aceramic sites.

In the Casamero survey area, sandstone, limestone, and cherts have the highest frequency of the material types by time period. Conchoidal, non-conchoical, and chalcedonic petrified woods are the dominant material types at Pierre's, and, as with the Casamero survey area, it seems as though local material types have a higher frequency of use when compared to exotics throughout the occupation.

Tables 8.7 and 8.8 list exotic material types and their frequency by time period as recorded from the two survey areas. The term exotic is meant to describe material types with source areas outside the site catchment and that are considered intrusive in the local assemblage (Jacobson 1984). These exotic designations have been adapted from Cameron (1984), Jacobson (1984), and Schutt (1982, n.d.). Because this was a non-collection survey, obsidian types were based on visual identification, and no samples were taken for trace element analysis.

Among the exotics, Zuni petrified woods have the highest frequency for both the Early Pueblo II and Late Pueblo II periods in the Casamero survey area. Chinle chert has the highest frequency for the Late Pueblo II and Early Pueblo III periods in the Pierre's survey area and Zuni woods have the highest frequency for aceramic sites recorded.

The high frequency of Chinle chert (1072) among the exotics occurring during the Late Pueblo II-Early Pueblo III periods in the Pierre's survey area correlates with Cameron's (1984) frequency for the same material type in Chaco Canyon where it reaches a peak at A.D.1100. It is also interesting that although defined as a local material for the Casamero survey area, Chinle chert also has a high occurrence on sites that date to the Late Pueblo II period in this area. One probable source for Chinle chert is the Yeso Formation of Upper Permian, eight miles south of the Casamero survey area (Schutt 1982). If the outlier of Casamero and its contemporary community were linked to Chaco Canyon via a road/trade network then this would be an obvious route for the Chinle chert (1072) material to pass enroute to the north. If Chinle chert (1072) had passed from Chaco Canyon to Pierre's then this would contrast with Cameron's (1984) and Powers et al.'s (1983) suggestion that exchange items were consumed in Chaco Canyon and not redistributed elsewhere.

Zuni petrified wood (1160) also shows a high relative frequency for the Casamero survey area in the Early Pueblo II-Late Pueblo II periods which corresponds to its peak (A.D. 1020-1120) in Chaco Canyon (Cameron 1984).

CHAPTER 9

THE CASAMERO-PIERRE'S OUTLIER COMMUNITY SURVEY AND THE CHACO SYSTEM[1]

Joseph Winter

Summary of Survey Results

An intensive, 100 percent archaeological survey at the 160-acre Casamero and the 430-acre Pierre's parcels resulted in the recording of 83 sites (see Harper et al. 1988:Tables 4.1-4.2, Figures 4.1-4.2, and Appendix 1). Thirty-nine of the sites were in the Casamero parcel, including Casamero Pueblo (LA 8779), a Late Pueblo II period (A.D. 950 to 1050) Chacoan outlier "great house" with a ceramic mean date of A.D. 1048. Previous excavations by the Cottonwood Gulch Foundation (Sigleo 1966, 1967, 1981; Chapter 4), stabilization work by the Bureau of Land Management (Lester and Neller 1978, Neller 1978; Chapter 5), and an intensive survey by Marshall et al. (1979) revealed that the pueblo is an L-shaped ruin of approximately 20 single story rooms (with one or more of rows of second story rooms) and one to three kivas, with an associated 21 m diameter great kiva 65 m to the south (Figure 9.1). Our survey revealed a second possible great kiva (LA 67158) approximately 75 m to the northeast of the main ruin, also with a Late Pueblo II ceramic assemblage. Marshall et al. (1979) suggest the main great kiva was actually built in Early Pueblo II times before the addition of the great house, and that it continued to be used in association with the great house in Late Pueblo II times.

In addition to the associated great kiva (or kivas), prior studies have also suggested the presence of one or two Chacoan roads, linking up Casamero Pueblo with the Andrews outlier to the southeast, and perhaps with other outliers to the west (see Map 51 in Nials et al. 1987). The evidence presented in Nials et al. (1987) is somewhat contradictory, because on the one hand they state that "none of the imaged segments could be verified as a prehistoric road" (1987:23), while on the other they state that "A depression fitting some of the characteristics of a prehistoric road may be seen on the ground west of the Borrego Pass Road within the fenced protection area" (1987:136). They also state that "This linear swale is visible on aerial photography and in aerial reconnaissance. Surface inspection by Morrison, Lutonsky, and Phillips in 1979 indicated that the feature was two-to-five m wide and up to .25 m deep" (Nials 1987:36). Our survey (as well as Gaudy's [1984] previous unpublished survey) suggested that at least one of the segments is indeed present, because a clear and definite swale is associated with sites LA 66044 and LA 66045, in the exact location projected on their Map 51 (Figure 9.2). As noted by Morrison (Nials et al. 1987:136), evidence of historic reuse is apparent, but we agree with Morrison that the swale is probably of prehistoric origin.

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[1] This chapter initially appeared as Chapter 8 in Harper et al. (1988).

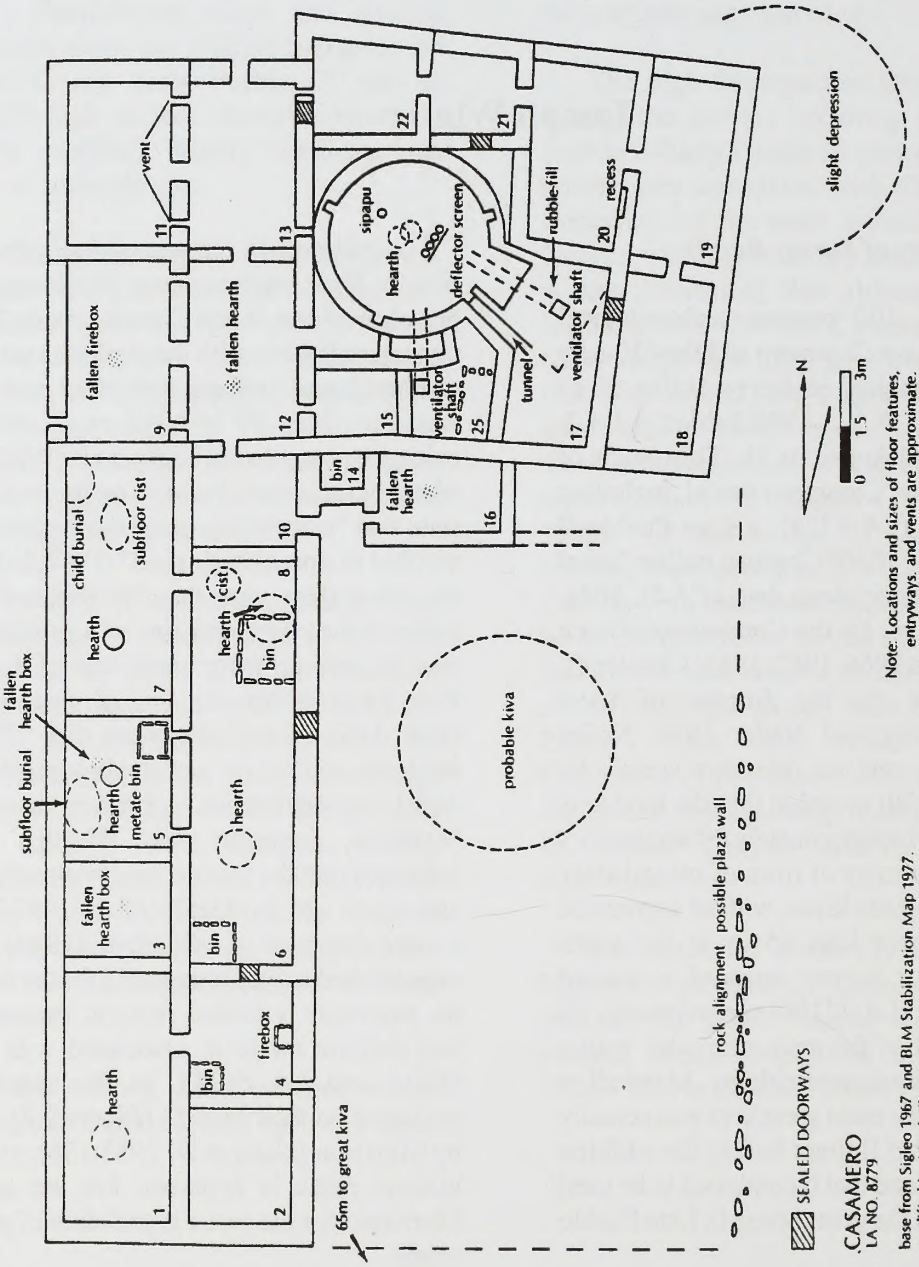

Figure 9.1. Casamero Pueblo from Marshall et al. (1979:135). (From Harper et al. 1988:Figure 8.2.)

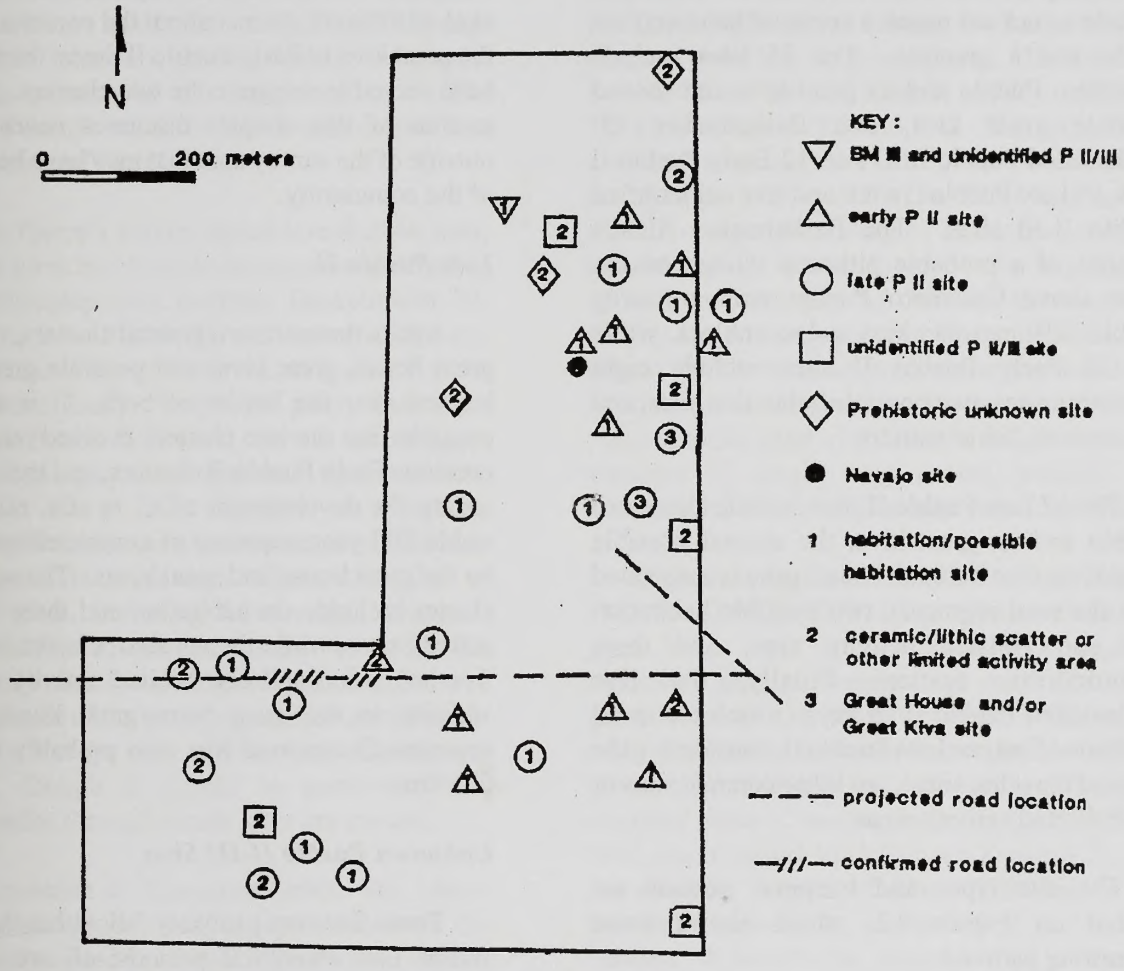

Figure 9.2. Site locations within the Casamero parcel, by period and type. (From Harper et al. 1988:Figure 8.2.)

Of the 39 sites in the Casamero parcel, one is a Navajo corral, 35 are Ancestral Pueblo, and three are probable Ancestral Pueblo. The latter include a rock art panel, a series of hand and toe holds, and a granary. The 35 sites include Casamero Pueblo and its great kiva, the second possible great kiva, one Basketmaker III-unidentified Pueblo II/III site, 12 Early Pueblo II sites, 17 Late Pueblo II sites, and five unidentified Pueblo II-III sites. The Basketmaker III site consists of a probable pithouse village on the mesa above Casamero Pueblo with a nearby Pueblo II/III masonry kiva and roomblock, while the 12 Early Pueblo II sites include eight habitation sites, two possible habitation sites, and two ceramic/lithic scatters.

The 17 Late Pueblo II sites include Casamero Pueblo and its great kiva, the second possible great kiva, nine habitation sites (one is associated with the road segment), two possible habitation sites, an isolated activity area, and three ceramic/lithic scatters. Finally, the five unidentified Pueblo II/III sites (which are in all likelihood Early or Late Pueblo II, considering the dates of the other sites), are lithic/ceramic sites or other limited activity areas.

The site types and temporal periods are plotted on Figure 9.2, which shows some interesting patterns.

Basketmaker III

Only one site is present, which is too small a database to show any pattern. However, the absence of other Basketmaker III sites and the complete absence of Pueblo I sites is undoubtedly significant.

Early Pueblo II

Two clusters of sites are present, with a gap in between them. The southern cluster includes four habitation sites and two artifact scatter/limited activity sites, while the northern cluster has six habitation sites. All are located on the gently sloping flats, and are probably farming-associated residential and limited activity sites. If Marshall et al. (1979) are correct about the construction of the great kiva in Early Pueblo II times, then it may have served to integrate the two clusters. A later section of this chapter discusses nearby sites outside of the survey area that may have been part of the community.

Late Pueblo II

Again, there are two general clusters, with the great house, great kiva, and possible great kiva located near the border of both. It is entirely possible that the two clusters evolved out of the previous Early Pueblo II clusters, and that we are seeing the development of an *in situ*, relatively stable 200 year sequence of communities linked by the great house and great kivas. The southern cluster includes six habitation and three limited activity sites, while the northern cluster includes five habitation and one limited activity site, in addition to the great house/great kivas. The apparent Chaco road was also probably used at this time.

Unknown Pueblo II-III Sites

These five sites probably fall within the Early and/or Late Pueblo II periods; all are limited activity sites, and they could be part of one or both of the previously mentioned "communities."

Other significant facts about the Casamero sites have to do with ceramics and lithics. Assuming that Cibola wares were locally made, over 99 percent of the sherds were of local origin, and only a few nonlocal sherds were present: One each of Socorro Black-on-white, Sosi Black-on-white, and San Juan Redware; and eight sherds of White Mountain Redware. The vast majority of lithics were also of local origin, and of them a relatively high number (26.6 percent) were groundstone tools, which could indicate an emphasis on food processing and farming.

Probably the relatively high Ancestral Pueblo site density (one site every 4.2 acres) and the large number of habitation sites (21 of the 38 Ancestral Pueblo sites are habitation units) (Figure 9.2) also reflect a relatively stable, fairly successful farming community (or communities). The possible ramifications of this are discussed in a later section of this chapter.

The Pierre's survey parcel revealed 44 sites; of these three had Archaic components (including one multicomponent Archaic, Basketmaker III-Pueblo I, Late Pueblo II, and unknown Pueblo II/III artifact scatter); 14 were Late Pueblo II sites; eight were Early Pueblo III sites; five were unknown Pueblo II/III sites; one was a roasting pit with a single gray sherd that could date anywhere from A.D. 500 to 1200+; another was a possible Ancestral Pueblo room or cairn; and still another was a possible check dam. There were also 14 Navajo sites, including three which also had Ancestral Pueblo components that fell within the previously mentioned temporal periods. Because the emphasis of the project is on Ancestral Pueblo sites, the Navajo sites will not be discussed any further, though it should be mentioned that Gobernador through recent sites are present.

In contrast to Casamero, where the Chaco great house, great kivas, and probably even the roads were added to an existing Ancestral Pueblo community, two of the three Pierre's great houses are contemporaneous with Late Pueblo II sites, and only the third was added in Early Pueblo III (A.D. 1120-1220) times. Only a small Basketmaker III-Pueblo I ceramic/lithic scatter preceded them, and otherwise all of the Ancestral Pueblo sites on the Pierre's survey parcel appear to have been created in association with the Chaco great houses, and perhaps the North Road.

Fifteen of the 31 apparent Ancestral Pueblo sites were dated by ceramics to the Late Pueblo II period. They included three ceramic/lithic scatters, six habitation sites, one apparent kiva site, one possible "herradura" (a horseshoe-shaped, low masonry enclosure, road associated site), one field house or storage room, a one-room site, and two Chacoan great houses. The latter are LA 16508 or Pierre's House B and LA 16515 or "El Faro" (Figures 9.3 and 9.4). The former has a ceramic mean date of A.D. 1070, and is situated on top of the "Acropolis" mesa. It is composed of a massive square building of 11 rooms arranged around a single surface kiva, thereby forming an 18 by 19 m rectangle. LA 16515 at the base of a nearby mesa is very close to the projected location of the North Road (we were unable to verify its location on the ground). Its two middens had mean ceramic dates of A.D. 1076 and 1108, and it contains 17 single story rooms, possibly 12 second story rooms, and as many as three kivas.

Eight sites are Early Pueblo III or Late Bonito Phase (A.D. 1120-1220) in age. They include one great house and an associated structure, six habitation sites, and one storage room site. The great house is LA 16509 or Pierre's House A, while the nearby associated structure is Pierre's House C. Stein, Kight, Loose, and Levine, recorded House C as a separate site, LA 35423, in 1981 (see Kincaid 1983:C-9 and Figure 9.3), but we consider it part of LA 16509 due to its proximity, association, size and shape, and lack of midden. Kincaid also proposed that a "ramp" between it and LA 16509 represents a spur of the North Road and thereby provides a formal entrance to the "Acropolis," but this should be considered conjecture.

House C is a single room measuring 6.5 by 7.5 m, while House A had perhaps as many as nine rooms and three kivas (the southern and eastern walls have collapsed). Mills (Chapter 7) gives it a ceramic mean date of A.D. 1099, though her overall assemblage dates (Harper et al. 1988:Appendix 2B) provide an Early Pueblo III designation.

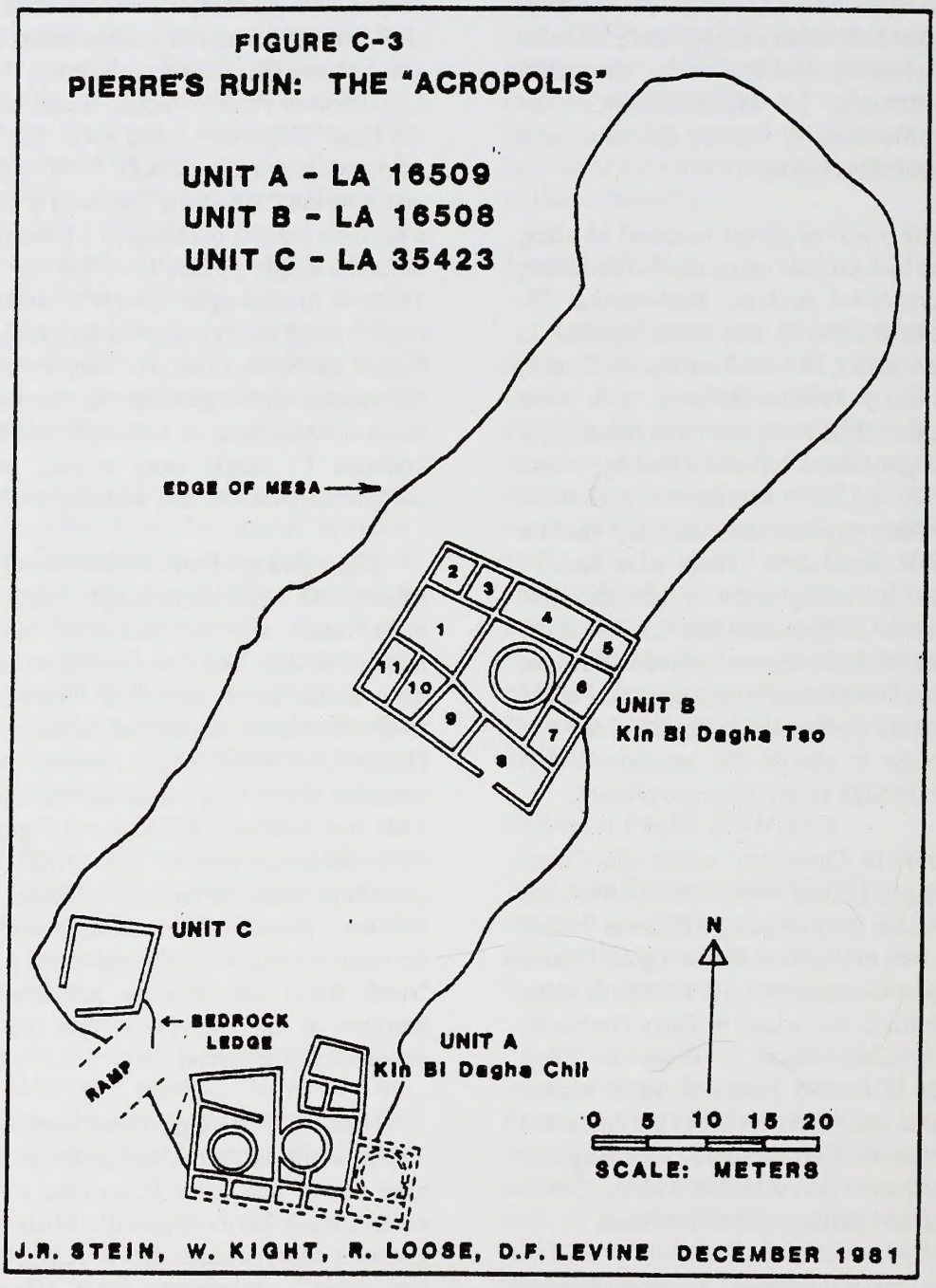

Figure 9.3. LA 16508 and LA 16509 at Pierre's community. (From Kincaid 1983:Figure C-3 as reproduced in Harper et al. 1988:Figure 8.3.)

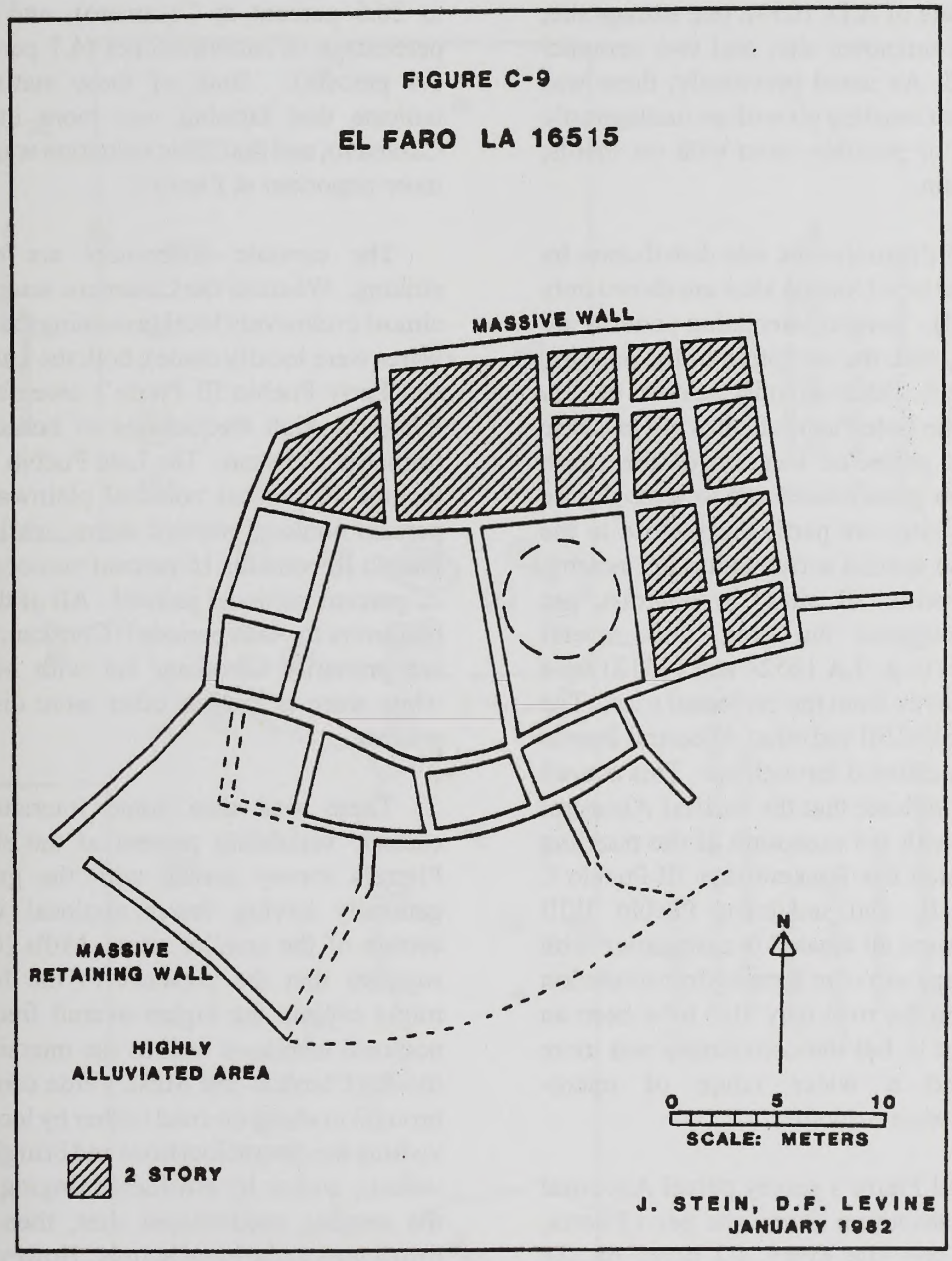

Figure 6.4 LA 16515 at Pierre's community. (From Kincaid 1983:Figure C-9 as reproduced in Harper et al. 1988:Figure 8.4.)

The five sites that were dated to Pueblo II/III times (the exact phases are unknown) include a possible watch tower (LA 16520 or "El Butito" with a mean date of A.D. 1059); one storage site, one structural unknown site; and two ceramic/ lithic scatters. As noted previously, there was also an apparent roasting pit with an undiagnostic sherd, a cairn or possible room with no sherds, and a check dam.

Figure 9.5 illustrates the site distribution by time period and type (Navajo sites are shown only by time period). Several interesting patterns are present. First, with the exception of the outlying multicomponent lithic/ceramic scatter at LA 66022, all of the Late Pueblo II sites are in a core area, near the projected location of the North Road. The two great houses and to some degree the habitation sites are particularly close to the road, while the special activity sites are nearby. The Early Pueblo III sites, in contrast, are scattered throughout the area, and several habitation sites (e.g., LA 16524 and 16512) are a mile or more away from the projected road. The unknown Pueblo II/III and other Ancestral Pueblo sites are also scattered throughout. This overall pattern could indicate that the earliest Ancestral Pueblo sites (with the exception of the puzzling LA 66022 which has Basketmaker III-Pueblo I, Late Pueblo II, and unknown Pueblo II/III components) were all created in association with the road, perhaps as a core farming/transportation community and the road may also have been an integral part of it, but the community was more dispersed, and a wider range of micro-environments were exploited.

The overall Pierre's survey parcel Ancestral Pueblo site distribution is one site per 13 acres, compared to one site every 4.2 acres on the Casamero parcel. Clearly there was a much higher density of Ancestral Pueblo sites at Casamero (despite the fact that there was only one great house at Casamero, versus three at Pierre's), and there was also the absence of a great kiva at Pierre's, while Casamero may have had two. Other important differences include the lower percentage of groundstone at Pierre's (8.87 percent of the total lithic assemblage as compared to 26.6 percent at Casamero), and the higher percentage of hammerstones (4.7 percent versus 1.4 percent). Both of these statistics could indicate that farming was more important at Casamero, and that lithic reduction was somewhat more important at Pierre's.

The ceramic differences are even more striking. Whereas the Casamero assemblage was almost exclusively local (assuming that the Cibola wares were locally made), both the Late Pueblo II and Early Pueblo III Pierre's assemblages have relatively high frequencies of nonlocal wares, primarily Chuskan. The Late Pueblo II ceramics include 12 percent nonlocal plainwares and 13 percent nonlocal painted wares, while the Early Pueblo III contains 16 percent nonlocal plain and 22 percent nonlocal painted. All of the nonlocal plainware for both periods is Chuskan; the painted are primarily Chuskan, but with Mesa Verde white ware as well as other more distant wares present.

There was also some intersite nonlocal ceramic variability present at the sites on the Pierre's survey parcel, with the great houses generally having fewer nonlocal wares than certain of the smaller sites. Mills (Chapter 7), suggests that the presence of the North Road might explain the higher overall frequencies of nonlocal wares, as well as the intersite variability–the Chuskan and Mesa Verde ceramics were brought in along the road (either by local residents visiting the distant locations and bringing back the vessels, and/or by outsiders bringing them in to the smaller, road-related sites, then they were distributed to the great houses. However, because the North Road does not connect directly with the Chuskan area, Chuskan ceramics would first have to be brought to some other location that was connected with Pierre's (e.g., Pueblo Alto); or have traveled overland, and not on a road.

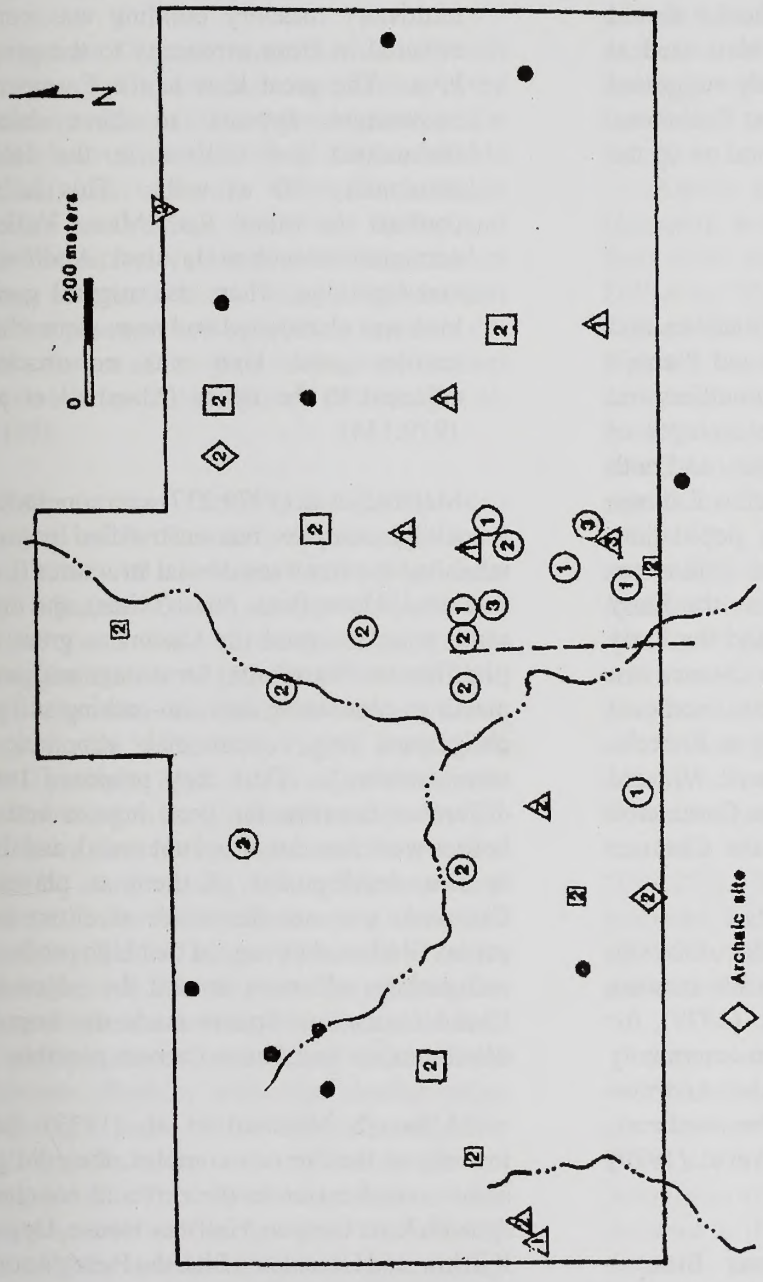

Figure 9.5. Site location within the Pierre's parcel, by period and type. (From Harper et al. 1988.)

Brandi (Chapter 8) has also commented on the nonlocal lithics and offered a road-related suggestion. Although the Pierre's (and Casamero) inhabitants generally used local lithics, some Chinle chert was used at Pierre's where it should be considered an exotic. It was also used at Chaco Canyon, so Brandi tentatively suggested that it might have been procured near Casamero, then taken north to Chaco Canyon and on up the North Road to Pierre's.

Discussion

Clearly there are important similarities and differences between the Casamero and Pierre's site complexes. Both have Chacoan outliers and apparent roads, both have high percentages of Cibola ceramic wares and local lithics, and both had a heavy occupation in Late Pueblo II times, probably with a resident farming population. However, there are also important differences between the two complexes, such as the Early Pueblo II occupation at Casamero and the Early Pueblo III occupation at Pierre's, the absence of a great kiva at Pierre's, and the presence of nonlocal ceramics (and possibly lithic types) at Pierre's. What could account for this difference? Why did Pierre's start later and end later than Casamero? What do these sites tell us about the Chacoan outlier and road systems?

Previous studies at one or the other of the site complexes have produced some possible answers to these questions. Marshall et al. (1979), for example, proposed that the Casamero community was established as a colony of the Andrews community across the valley to the southeast, probably around A.D. 900. Marshall et al. (1979) state:

> The Casamero community was first established as a colony of the Andrews community complex, probably during the very late PI period or very early PII period, ca. A.D. 900. Once the community attained sufficient size and independence, a great kiva was constructed to serve as the socio-religious center. During the late PII period, as in most of the Red Mesa Valley, a large, multistory masonry building was constructed in close proximity to the great kiva. The great kiva in the Casamero community appears to have been maintained and utilized in the later community life as well. This is in contrast to other Red Mesa Valley communities such as Haystack, Andrews, and Coolidge, where the original great kiva was abandoned and new, somewhat smaller great kiva was constructed adjacent to the house (Marshall et al. 1979:134).

Marshall et al. (1979:337) also concluded that a socially complex but unstratified population inhabited the small residential structures (i.e., the so-called "Hosta Butte Phase" sites), and that this same populace used the Casamero great house (the "Bonito Phase" site) for storage and periodic meetings concerning decision-making and public obligations (e.g., ceremonial, economic, and administrative). Thus they proposed that the difference between the great houses and small houses were functional and not social, and that the *in situ* development of them at places like Casamero was not the result of elitist colonization. Rather, they argued that high productivity and perhaps alliances around the edges of the Chaco Interaction Sphere made the impressive developments and Chaco Canyon possible.

Although Marshall et al. (1979) did not investigate the Pierre's complex, they did give it some consideration in their overall conclusions. As with Kutz Canyon, Halfway House, Upper Kin Klizhin, and Greenlee's Site, the Pierre's complex is a road-related outlier that is not associated with productive soils and that lacks a great kiva. The great houses and associated communities at these sites are also small, so Marshall et al. (1979:337) concluded that great kivas were not necessary at

logistical road-related sites, or that no social group capable of building and maintaining great kivas was responsible for road sites away from good farming land.

In contrast, Casamero and other outliers with great kivas and associated communities were immediately adjacent to good farming land, and in fact there is evidence that not all of the available farm land was utilized. "Not all favorable agriculture areas in the Red Mesa Valley and Dutton Plateau were 'packed' with early Anasazi farming communities. This suggests that population pressure in the periphery certainly did not force the use of marginal lands, since the best lands were never fully utilized" (Marshall et al. 1979:339).

Whitmore and Schaafsma (1979) also commented on the Casamero community, based on their survey of a six square mile area immediately adjacent to our survey area, to the west/southwest. Sixty-three Ancestral Pueblo sites, ranging from small sherd scatters to multiple room blocks were documented, with an occupation primarily in the Early Pueblo II and Late Pueblo II periods. Most, if not all, of these sites appear to belong to the Casamero community (or communities) documented by our and Marshall et al.'s (1979) studies; and, in fact, Whitmore and Schaafsma observed that there was a cluster of sites within a 2-mile radius of Casamero Pueblo, and that beyond this distance the community began to disperse. Seventy-one percent of their large, multiple room sites occurred within a mile of Casamero Pueblo, while the smaller room blocks, single room "farm houses," and other limited activity sites were primarily in the outlying areas. This distribution supports the pattern we observed in the area immediately surrounding the ruin and adds to it because they found that the Early Pueblo II sites were dispersed throughout the area, while the Late Pueblo II sites were clustered together, closer to Casamero Pueblo (which is a Late Pueblo II great house). This also supports our conclusion that the Late Pueblo II Casamero Chacoan outlier community evolved out of an existing Early Pueblo II community, but it also suggests that there was a pattern of community coalition or aggregation over time, which we could not see because our survey was only in the inner, nuclear area around the outlier.

Powers et al. (1983) considered both the Casamero and Pierre's site distribution data in their wide ranging study of Chacoan outliers. Following Whitmore and Schaafsma (1979), they defined the Casamero outlier community as the high site density area around the outlier, with a peripheral settlement around that. They also recorded and analyzed 23 Ancestral Pueblo sites in a 3 km area around Pierre's and observed a significant drop in site density outside the core area. This core area, they proposed, was a community around the main Pierre's sites. "The relationship of peripheral, lower density areas to the focal higher site density area remains undocumented, and the question of whether these peripheral areas should be considered part of the actual community is unresolved. (The high site density community area should not be confused with the much larger peripheral settlement and economic resource range . . . .)" (Powers et al. 1983:259). Elsewhere Powers et al. (1983:327) proposed that 10 km was the limit for everyday resource exploitation, and thus for the peripheral settlement and economic resource range.

Powers et al. (1983) also followed Whitemore and Schaafsma (1979) in analyzing the changes in site types around the core areas of Casamero and Pierre's. As stated previously, Whitmore and Schaafsma identified a decrease in site size and an increase in the frequency of special use sites as distance increased from Casamero Pueblo. Powers observed "hints of similar patterns" at Pierre's, "where limited use sites in peripheral areas may represent loci supportive to the community" (Powers et al. 1983:261).

We agree that there may well be distant special use sites (and even residential sites) that were "supportive to the community." However, as shown by Figures 9.2 and 9.5, there were also special use sites *within* the community, and in fact at both Casamero and Pierre's there are small, special use sites located within a few hundred meters of the great houses. Whitmore and Schaafsma were not able to see these sites because their survey began over a quarter mile away from Casamero Pueblo, while Powers' survey concentrated on the structural sites.

Based on the results of their survey at a number of outliers in addition to Casamero and Pierre's, Powers et al. (1983) offered a number of conclusions about the nature of the outlier system and its relations with Chaco Canyon. The large canyon sites, they argued, were at the apex of a regional, hierarchical settlement system, which tied the outliers together through exchange, labor, ceremonies, and perhaps kinship. They believed that the canyon population was supported economically not only by its own environment but also as the center of a regional community and road network which extended its economic range throughout the San Juan Basin via inter-community exchange of corn and other plant foods, firewood, animal products, lithic and ceramic materials, and other goods obtained within or adjacent to the Basin, as well as materials from outside it, such as turquoise, obsidian, cotton, and salt. Over time a redistribution exchange system with Chaco at its core may have evolved, with canyon labor crews constructing the outliers, and perhaps even the great kivas, in exchange for the foodstuffs and other material. The roads were key elements of the system, they argue, because each road linked a different part of the Basin with the canyon, and thus a variety of Basin and extra-basin environments and communities were involved in the exchange.

Based on their analysis of the ceramics and lithics at Pierre's, Powers et al. (1983) concluded (as did we) that the Pierre's sites contained higher frequencies of intrusive lithics and ceramics than expected, as did certain other road-associated outliers. They suggested that these intrusives, such as #1080 yellow-brown chert from the Red Mesa Valley and Zuni area and trachyte-tempered Chuskan ceramics, were funneled along the roads to Chaco Canyon and that the road system should therefore be considered as "exchange corridors." And while they agree with earlier researchers such as Judge (1977b, 1979) and Schelberg (1979) that Chaco *may* have functioned as a redistribution center for foodstuffs, lithics, ceramics, and other valuable items, they doubt that formal redistribution was very important or that Chaco functioned very effectively as a redistribution center because most outliers have substantially lower frequencies of these items than at Chaco Canyon (or at Pierre's). They propose instead that the exchange system in operation was reciprocal (perhaps based on actual or fictive kinship relations), and that it was direct and between Chaco and particular outliers and their communities, and not necessarily between the communities themselves. This does not explain the higher frequencies of intrusive lithics and ceramics at Pierre's, although Powers et al. (1983:342) imply that its proximity to Chaco Canyon may have been a factor.

Powers (1984a, 1984b) has elaborated on certain of these proposals. For example, Powers (1984a) describes the Casamero and Pierre's site complexes as third order communities at the lowest level of the Chacoan hierarchy. The outliers themselves were the centers of these communities, and while they probably lacked "elites," the second order, medium sized communities they were in contact with (such as Pueblo Alto for Pierre's) and the first order, large central sites in Chaco Canyon probably had them. The first order sites ". . . occupied positions at the apex of power and importance in the Chacoan system and in some undefined fashion coordinated or controlled interaction between the canyon sites and outlying communities," while the second

order, road related sites "may have controlled a single road system and its attendant communities" (Powers 1984a:32). The relatively high frequencies of Chuskan ceramics and intrusive lithics at the first order sites led Powers to conclude that exchange occurred between the outliers and Chaco Canyon, but again, he does not believe that the overall system involved redistribution because the intrusive ceramics and lithics were "consumed" in the canyon and not passed along to outliers along the road system. Instead of a redistribution system, he envisioned an alliance system, with the first order sites providing turquoise, shell, obsidian, salt, and other imports, and seasonal labor.

Powers (1984b) is even more explicit in his use of the Casamero data. In fact, he argues that Casamero Pueblo may have been a craft center for the production of Red Mesa Black-on-white and other Red Mesa Valley ceramics that were traded north into Chaco Canyon, and he concludes that once they arrived there they were used rather than redistributed elsewhere. Similarly, Chuskan ceramics "occur in substantial quantities throughout the west-central portion of the San Juan Basin and Chaco Canyon, (but) only small numbers . . . found their way to southern outliers in the Red Mesa Valley . . ." (Powers 1984b:56).

It should be noted that our data and conclusions contradict certain of Powers', especially regarding the distribution of Red Mesa Valley and Chuskan ceramics. First, the presence of relatively high percentages of Chuskan ceramics at Pierre's, for example, indicates that they did, in fact, pass through Chaco Canyon along a road system and on to an outlier, or that they were carried overland, away from a road system.

Either way they were not "consumed" in Chaco Canyon, and they clearly reflect "some kind" of an exchange relationship, not only between Chaco Canyon and its outliers, but also among the outlying areas (i.e., between the Chuskan and Pierre's areas).

Second, the presence of Red Mesa Black-on-white in Chaco Canyon does not necessarily indicate that this material originated at Casamero or some other Red Mesa Valley site. Mills (Chapter 7), in fact, assumes that Red Mesa Black-on-white and the other Cibola types reflect basin-wide styles and should thus be considered "local" rather than intrusive in Chaco Canyon. To our knowledge there have been no detailed, published temper analyses that would contradict this assumption, and most other authors, such as Toll (1985), agree that the Cibola White wares should be considered local to the Basin, rather than imports (or at least the Chaco types are; the Socorro and Reserve Cibolan types are another matter). Toll also proposes that any ceramic specialization that was present was low-level, and that the "standardization" of the Cibola types "reflects the necessity of maintaining an interactive base over as broad an area as possible, rather than control by a few individuals" (Toll 1985:IV). With regard to Casamero, Toll based this conclusion on Marshall et al.'s (1979) and Powers et al.'s (1983) data.

Few, if any, other researchers have dealt directly with Casamero Pueblo, although several have investigated or at least analyzed Pierre's. The present author (Winter 1981), for example, considered 42 Ancestral Pueblo sites in the Salt River Project survey area as part of the Pierre's complex, and I suggested that the combination of Chaco structures, habitation sites, road segments, and limited use sites indicate that the Pierre's community was a "productive" complex rather than merely a "transportation" outlier. This classification followed Loose's (1976) and Marshall et al.'s (1979) proposal that there were two types of Chacoan outliers, each with different morphology, function, and spacing. Productive outliers were located in arable zones with good soils, moisture, and growing seasons. They were

spaced about 13 km apart, in areas of high local site density. The numerous surrounding small sites produced the crops and other goods, while the outliers served as local administrative/ redistribution centers. Because of climatic change and/or continuous population increase, all available productive niches had habitation sites, field houses and related productive stations, with nearby administrative centers and a road leading to the main centers in Chaco Canyon. Transportation centers, in contrast, were scattered along the roads in order to move the resources to and from the central canyon. They were not associated with smaller villages, and were spaced at intervals of 19 km. Goods flowed through them to the canyon centers which controlled the exchange of food, trachyte-tempered ceramics, chert, obsidian, turquoise, and other resources across the basin.

Based on the Salt River Project survey data, the configuration of the Pierre's complex suggested to me that it was a "productive" community. Transportation along the road may also have been an important feature of the complex, but I believed at that time that it was likely that the fairly local population (as suggested by the number of sites) was relatively self-sufficient.

I now realize that the situation is much more complex and that the dichotomy between "productive communities" and "transportation outliers" is probably a gross over-simplification. Also, the 1981 suggestions were made without the benefit of the detailed comparative data from Casamero (or even the detailed Pierre's data obtained by Powers et al. [1983] and the present project). Thus, if the dichotomy has to be used, I would now argue that the Pierre's complex is more road-related than Casamero, and that its primary function was somehow involved with exchange along the road, while the Casamero outlier complex was added to a relatively self-sufficient farming community that was already in existence. These ideas are discussed below in a later section.

Kincaid (1983) also considered the relation of the Pierre's complex to the North Road, and, in fact, she argued that:

> Pierre's was constructed and utilized coeval with the North Road. Indeed, arrangement of the major structures within the complex acted to preserve the bearing of the road and to "receive" it into the community. It is thought that the Pierre's complex represents a constellation of special-function architecture whose location was probably predetermined during the engineering process for the North Road. Although the presence of residential architecture within the ruin group should not be ruled out, it does not appear as though the site maintained a residential population sufficiently large to be self-supporting. Evidence for a lengthy evolution of the Pierre's community is lacking and it is doubtful that the proximity of agriculturally productive soils determined its location (Kincaid 1983:8-9).

As part of this investigation, Kincaid and her colleagues surveyed a 400-m wide corridor north from Escavada Wash to Pierre's. They also named and recorded many of the sites in the community, including the "Acropolis" (the Chacoan structures at LA 16508 and LA 16509), and "El Faro" (The Lighthouse), the Chacoan structure at LA 16515, and the site on the badland spire above it. They concluded that virtually all structural sites at Pierre's were either great houses in direct association with the road (such as El Faro and the Acropolis), or were minor structures ("Avanzadas") elevated above the road and also in association with it. They even identified the "Pierre's Causeway" (LA 34301, which we could not relocate), apparently a spur off the North Road

which ran up the west side of the Pierre's butte and ended in a "ramp" to the summit of the Acropolis, between Houses A and C of LA 16509.

The final work of note which considers the Pierre's site is Doyel et al.'s (1984) article resulting from the Bis sa'ani Project. Although Doyel, Breternitz, and Marshall realized that Loose's (1976) and Marshall et al.'s (1979) "production" and "transportation" outlier dichotomy was oversimplified, they recognized that it had value because it introduced the concept of specialization among different outliers. They therefore took it one step farther by distinguishing between "ancestral" and "scion" communities.

> Ancestral communities have significant time depth, perhaps reaching back into the Basketmaker III period. Such sites often possess a wide range and great quantity of features and are usually located in favorable environments where arable land and water are available. In contrast, scion communities appear late in the Chaco sequence, have limited time depth (usually late Bonito Phase), are often smaller in size, lack features typical of ancestral communities such as great kivas, and are often located in marginal environment zones. Scion communities may have developed as a result of population growth, immigration, factionalism within ancestral communities, or as satellite communities to exploit locally available resources or markets (Doyel et al. 1984:38-39).

Doyel et al. agree with most other researchers that the environment of the large sites in Chaco Canyon was probably incapable of supporting the canyon population, and that a formal exchange network was probably in operation. However, they also propose that Bis sa'ani, Pierre's, and other communities in adjacent areas could have greatly magnified the productivity of the general canyon region, and that these sites should be considered part of the "Chaco Halo"–a dynamic series of adjacent agricultural production centers, seasonal occupation sites, and road-related locations exploited by the inhabitants of the central canyon. This halo of communities and land use activities around the canyon grew and expanded over time, and by the Late Bonito Phase several scion communities which lacked great kivas, including Pierre's and Bis sa'ani, were added to it. It is unknown if these new outliers contributed directly to the support of the central canyon centers, or to the greater halo "megacommunity." Several different classes of outlying and peripheral communities, such as ancestral, scion, and purely road-related, may have had different relationships to the main canyon, and these relationships probably changed over time. Groups from the main canyon great houses may even have been dispersed among these sites on a seasonal basis, and it could even be that the great houses in the main canyon were utilized by affiliated communities in the halo, and perhaps even by more distant communities in the periphery of the San Juan Basin. The latter possibility obviously has relevance for Casamero and the other, distant "ancestral" communities:

> Chaco Canyon may be envisioned as a central node developed by the outlying communities to create an inter-community regional organization. It is then possible that the great pueblos in Chaco Canyon represent regional affiliates representative of certain community aggregates in the outlying provinces . . . The hypothesis that Chaco Canyon represents a regional capital composed of representative centers from various outlying districts should be tested and evaluated. It is possible that Chaco Canyon could not have existed without the support of the regional provinces (Doyel et al 1984:51).

Conclusions

Based on our survey data and the other information discussed in the preceding pages, the following conclusions about the Casamero and Pierre's outlier communities and their relations with the Chaco Interaction Sphere can be made:

1) The Late Pueblo II Casamero outlier community evolved out of an ancestral Early Pueblo II complex with the addition of one-to-two great kivas, a Chacoan great house, and probably one or more Chacoan roads. A fairly sizeable Basketmaker III site on the mesa above the complex may have been ancestral to the Early Pueblo II community, but it is more likely that the nearby Andrews complex was the immediate source because there are two Pueblo I great kivas and nine other Pueblo I components at Andrews. Wherever it came from, the Early Pueblo II population at Casamero appears to have been based in two general clusters of habitation and special use sites in a "community" that measured approximately 4 mi. in diameter. Special use sites (as reflected by ceramic and lithic scatters and small structures) were scattered throughout this area, while larger habitations occurred in the two core clusters. A great kiva may have served to integrate the two clusters, which could represent kinship groups. In Late Pueblo II times the Casamero community became an outlier with the addition of the road, great house, and perhaps a second great kiva. The basic ancestral community continued, though there appears to have been some aggregation around the great house which may have been intentionally constructed between the two clusters of habitation sites, so as to integrate them.

The intensity of the contact with Chaco Canyon and the nature of the interaction with other outliers cannot be determined at the present time. What is known, however, is that the community appears to have been fairly self-sufficient, and that there were few trade relations with groups outside of the Red Mesa Valley, at least if ceramics and lithics are an indication. Very few non-Cibolan ceramics were present, and almost all of the lithics were locally procured. Cibolan ceramics could have come in from elsewhere in the Chaco Interaction Sphere, but certainly there were no Chuskan, Mesa Verdean, or other more distant ceramics that appear in Chaco Canyon and at certain other outliers. In fact, the only indirect evidence of contact with Chaco Canyon and the Pierre's area is the road and great house, and the presence of cherts from the general Casamero areas in Chaco Canyon and at Pierre's. If Marshall et al. (1979) are correct, there was no "colonization" from Chaco Canyon and there were no elites at the great house, and it was local communities like Casamero with relatively high productivity that allowed the Chaco Interaction Sphere and the large sites in Chaco Canyon to develop.

We do not agree with Powers (1984a, 1984b) that Casamero was at the lowest level of a ranked, hierarchical three level system that had Chaco Canyon at its apex, nor do we agree that there is evidence (at least at the present time) to suggest that Casamero was a "craft center" which produced Red Mesa Black-on-white for "consumption" in Chaco Canyon. Rather, we propose that Casamero was a local community which developed out of the ancestral Red Mesa Valley Ancestral Pueblo population, that it was somehow linked or allied with Chaco Canyon, and that the nature of this alliance (beyond the physical manifestation of the apparent road and great house at the community, and the occurrence of local cherts at Chaco Canyon) is unclear.

2) The Pierre's community is another matter. Despite the presence of several Archaic sites and one multicomponent Basketmaker III-Pueblo I and later sherd scatter, there is a clear break between these and the Late Pueblo II sites, and in fact the latter seem to have appeared as a full blown outlier community organized around several great houses and the North Road. And while we disagree with Kincaid (1983), who concluded that

the whole complex was a special-function constellation of non-self supporting, road related sites, we agree that the road was an important element of the community, and that the community probably would not have been created if the road wasn't there. Clearly there was no ancestral, *in situ* development of an existing population, as at Casamero, and if anything Pierre's is an excellent example of Doyel et al.'s (1984) "scion outlier"–a limited time depth, Late Bonito Phase community without a great kiva that developed in a marginal location. It also fits well within their "Chaco Halo" concept of outlier communities adjacent to Chaco Canyon that may have somehow helped support the canyon, because the relative high frequencies of Chuskan ceramics and lower, yet still significant frequencies of nonlocal chert mirror to some degree the high frequencies of Chuskan ceramics and nonlocal chert at Pueblo Alto and other sites in the canyon. We have no idea why Pierre's was established or why its artifact assemblages are similar to those at Pueblo Alto, but clearly there was a close relationship between the two sites, and clearly the North Road was more than just a symbolic manifestation of that relationship.

Pierre's may have been established as a colony or some other scion of Pueblo Alto; it could have been a way station along the road where trade goods on their way to and from the San Juan Valley were temporarily stored; it could have been an outlying farming area for Pueblo Alto; it may have served a combination of any of these and/or other purposes, but obviously there was some kind of a relationship which cannot be explained by any of the existing models.

There were also some important temporary shifts within the community that may be related to this situation, and which are clearly in contrast to what happened at Casamero, where there appears to have been a tendency towards aggregation near the end of the Late Pueblo II occupation. At Pierre's the pattern was in the opposite direction, with the early (Late Pueblo II) sites clustered around the great houses and road, and the late (Early Pueblo III) sites in a more dispersed pattern. Possible explanations for this include internal population growth; additional people from the outside coming in; depletion of arable soils in the core area; changes in subsistence, such as an attempt to exploit a greater range of micro-environments; or a combination of these and many other factors. We simply do not know enough about Pierre's to answer these questions, and perhaps that is good, for Pierre's represents a fairly pristine and intact, unexcavated community that has enormous research potential.

3) One difference between the Casamero and Pierre's communities that we do feel fairly confident in discussing and which undoubtedly has a bearing on the above, is the perceived "marginality" of Pierre's and the higher "productivity" of Casamero. Running like a thread through most of the studies of the two communities and of most models of Chaco interaction is the concept of marginality and its role in the development of the "Chaco Interaction Sphere," "The Chaco Halo," the road system, the outlier system, etc. In fact, as discussed by the present author (Winter 1983), the belief that many Ancestral Pueblo cultural developments were attempts at coping with marginal environments is an underlying assumption in Southwestern research. Almost everyone who has written about the Ancestral Pueblo has used the marginality concept at one time or another, and has assumed that marginality is a near-constant variable in Ancestral Pueblo developments. It was for this reason that I reviewed the concepts of marginality, not only as it has been developed by archaeologists but also by biogeographers, and then I presented a unified theory of marginality which incorporated cultural processes into a biographic model (Winter 1980, 1983).

Very briefly, the model proposed that a marginal environment is one in which permanent, successful human population survival is impossible without outside sources of energy,

such as food, labor, fuel, clothing, people, and/or other materials beyond the solar energy, minerals, plants and animals, available locally. Human habitats form a gradient from optimal, to marginal, to lethal, depending on the combination of limiting factors and the ability of the population to avoid a detrimental effect through learned behavior, masking effects, and other adaptive responses. Most marginal environments are inadequate for long-term survival, and they cannot support permanent populations. However, they may be temporarily used (for days, weeks, years, or even generations) by very mobile, nomadic segments of a population; by non-breeding adults that cannot secure better habitats; or by pioneer colonists, migrants, and other segments of a population centered in an optimal habitat.

Ancestral Pueblo populations functioned under the same habitat constraints as many other species. Their environments formed a gradient from lethal to marginal to optimal, depending on the range of limiting factors that inhibited survival. However, the Ancestral Pueblo people, like other human groups, were more flexible than many other species because their range of tolerance was greater, primarily as a result of their responsive behavior and their ability to create cultural masking effects. For example, a nomadic, mobile population could have utilized a series of marginal habitats and still have survived. Any one marginal locality may have lacked sufficient requisites for permanent survival, but a combination of habitats could have provided the necessary requirements when used in different seasons or years. Also, like many other predators, the Ancestral Pueblo people could have procured food in one locality and transported it to another. It could have been transported directly to the procurer/consumer, or indirectly by trade. Also, certain sub-optimal environments could have been modified into less marginal habitats through food production, such as by an extensive agricultural system utilizing a variety of field locations or by an intensive farming system based on hydraulic control. Still others, however, may not have been suitable for agriculture, or may have been too limiting to have produced enough crops or other resources for permanent survival. Marginality was therefore relative to food procurement and production techniques, exchange systems, and other masking effects.

Finally, because many of the environments utilized by Ancestral Pueblo people were generally less complex, more fragile, and at younger successional stages than mature ecosystems, competition was reduced and the potential for disruption was much greater. Many of the Ancestral Pueblo cultural developments, such as intensive agriculture, population aggregation, exchange systems, and the seasonal movements of farmers, may have been attempts at coping with environments that the Ancestral Pueblo people themselves degraded.

Two general questions emerge from this discussion. First, were the Pierre's and/or Casamero environments truly marginal? And second, if so, could this explain the cultural developments that occurred there, and perhaps even the differences between the two communities?

With regard to the first question, current environmental conditions as plotted by Powers et al. (1983) and Cordell (1978) and as summarized in Table 9.1 show some important differences between the two areas. Casamero is higher; wetter; closer to arable land, water, and fuel; and has access to a greater variety of local plant and animal resources. Pierre's has a longer growing season, but the 140 days at Casamero is more than adequate for successful corn crops. Past environmental conditions were obviously different during the Early Pueblo II-Early Pueblo III periods, but it is expected that similar gradients of variation would have been present, i.e., Casamero would have been wetter and cooler, with more available resources, because it is higher and closer to the highlands beyond the San Juan Basin, no matter what the general climatic regime.

Table 9.1. Environmental conditions of Casamero and Pierre's.

Variable	Casamero	Pierre's
Elevation (m)[a]	2112	1981
Est. mean annual precipitation (mm)[a]	264	213
Est. mean annual precipitation (in)[b]	14	10
Growing season[b]	140 days	160 days
Distance to arable land (km)[a]	.3	.4
Distance to water (km)[a]	.3	.4
Effective temperature (degrees F)[b]	12.4	13.6
Distance to small conifers (km)[a]	.1	.5 (very low number)
Distance to large conifers (km)[a]	10[c]	15 (very low number)
Pueblo II/III ecological zones within 10 km:[a]		
Onsite	Plains grass/shrub, Plateau grass/shrub	Desert badland, Plains grass/shrub
1 km	Pinyon-juniper wood	Plateau grass/shrub
10 km	Ponderosa forest [c]	Data not given

[a] Powers et al. (1983:Table 29)
[b] Cordell (1978:end maps)
[c] Although Powers et al. (1983) do not mention it, isolated Ponderosa pine trees can be found on the north side of Ojos Tecolote Mesa, less than 1 km from Casamero Ruin.

Obviously these modern differences do not prove that Pierre's was in a marginal environment and that Casamero was not because marginality is relative to how the Ancestral Pueblo people adapted to a particular environment and whether they were able to survive over time in it, given outside sources of energy. However, they do indicate that the Pierre's environment is (and probably was) harsher than at Casamero, and that it has less available resources.

What, then, would "prove" marginality? Given the environmental differences between the two areas, we believe that the artifact variations are extremely significant and that they indicate that the Pierre's community was in a marginal environment (or in a more marginal environment than Casamero), because they indicate that there was a much greater dependence on outside sources of energy at Pierre's than at Casamero. Assuming that the presence of higher frequencies of nonlocal ceramics (Chuska and Mesa Verde) and lithics (intrusive cherts) are an indication of outside sources of energy, then the Pierre's data satisfy the requirements for proving marginality, especially in light of the fact that it had a drier and hotter environment than Casamero. We believe that this assumption is correct, that the ceramics and lithics not only represent sources of energy in and of themselves (especially if the pottery vessels were carrying foodstuffs), but that they also represent potential energy in that they reflect trade systems, kin ties, social obligations, political alliances, and similar forms of crucial energy

exchange between the people at Pierre's and those in the distant areas, even if it was indirect and channeled through Chaco Canyon.

The Casamero community, on the other hand, appears to have been much more self-sufficient and in a much less marginal setting. Not only is (and was) its environment more productive, but it supported a much denser distribution of sites (and presumably a larger human population), with far fewer indications of outside contacts (and by extension, outside sources of energy as reflected by intrusive ceramics and lithics). In fact, Powers (1984b) has suggested that its ceramics may have helped support Chaco Canyon, and while we disagree with this proposition (because the Red Mesa Black-on-white at Chaco could have been made at Chaco and not necessarily at Casamero), there are indications that cherts local to the Casamero area did help support the Chaco Canyon system, and perhaps even Pierre's.

With regard to the second question (how did the Casamero and Pierre's communities adapt to these conditions), I would like to offer the following reconstruction, which is based not only on our and others' work at the two communities, but also on Sebastian's (1988) recent computer simulation using tree-ring based retrodictions of rainfall for the Chaco Canyon area from A.D. 900 to 1200. Sebastian also compared investment in architecture in the canyon with agricultural productivity and proposed that "the elaboration of Chaco grew out of a widespread pattern of incipient sociopolitical differentiation and was a response to an improved rainfall regime that permitted surplus production" (Sebastian 1988: VIII).

Early Pueblo II (A.D. 900 to 1020)

The Pierre's area does not appear to have been used at this time. Casamero, in contrast, was heavily utilized; and, in fact, it appears that the ancestral Casamero community began during this time period, that it had close ties with the nearby Andrews community, and that possibly it was even formed by population growth from Andrews. Sebastian's model suggests that the years from A.D. 920 to 940 represented a period of low productivity, while A.D. 940 to 990 were of generally moderate to high productivity, and the late A.D. 990s to 1020 reflected a sharp downturn in productivity. She correlated the initial construction episode at three great houses in Chaco Canyon with the A.D. 920 to 940 downturn; the lack of construction with the higher productivity during the A.D. 940 to 990 period; and the burst of construction with the low productivity from the late A.D. 990s to 1020. She concluded that this inverse relationship between low productivity and high construction could reflect the fact that less successful farmers were undergoing subsistence stress, while successful producers in better locations were providing assistance in the form of corn and other supplies, and thereby achieving status and prestige that was reflected in larger and more elaborate structures.

Unfortunately, we do not know exactly where in this sequence the Early Pueblo II Casamero sites fit, as our ceramic dates are too inexact to correlate the construction and use of particular sites with particular events of low or high productivity. However, we do find it fascinating that there was an apparent expansion of a sizeable farming population into the area during a period of fluctuating productivity and that the Late Pueblo II great house was built at the end of this period, during or after a period of stress. It could well mean that this was one of the more productive, less marginal areas in the San Juan Basin and that by A.D. 1020 it was helping to support Chaco Canyon, thereby resulting in the construction of a great house and road to reaffirm and strengthen that support.

Late Pueblo II (A.D. 1020-1120)

During this period Casamero Pueblo was built, occupied, and abandoned, and the residential sites and special use sites in the

surrounding community began to cluster closer to the great house. The road was also probably used at this time, but by A.D. 1120 the whole community, including road, great house, and surrounding sites, was abandoned.

Just the opposite happened at Pierre's. Occupation began during this period, with several great houses, a core surrounding community, and the North Road built and used. Also, in contrast to Casamero, occupation continued after A.D. 1120, although there were some important changes.

Sebastian's productivity reconstruction indicates that A.D. 1020 to 1035 was generally good; A.D. 1035 to 1040 saw a sharp downturn; A.D.1040 to 1045 was good; A.D. 1045 to 1050 was bad; A.D. 1050 to 1090 was good; A.D. 1090 to 1100 was bad; and A.D. 1100 to 1130 was generally good, followed by a progressively deteriorating situation after A.D. 1130. Construction in Chaco Canyon during this overall period was massive and nearly constant regardless of whether productivity was high or low, and she proposed that "groups farming the most productive land converted greater agricultural success into sociopolitical power . . . by converting long-term relations to power and obligation into institutionalized leadership roles, perhaps based on religious mediation" (Sebastian 1988:VII).

We are not prepared to comment on Sebastian's sociopolitical reconstruction because we lack excavation data for Pierre's and the excavated material from Casamero has not yet been analyzed in any detail, but again we find it significant that *both* the Casamero and Pierre's areas saw the arrival of Chacoan outliers during this period, yet the communities reacted differently. At Casamero an outlier and road were added to an existing community, and by A.D. 1120 the whole community was abandoned. At Pierre's a new, scion outlier was created out of the blue, and it continued on after A.D. 1120. We propose that both phenomena were somehow related to the long, sharp downturn in productivity that ended around A.D. 1020 and the onset of very bad conditions after A.D. 1130; that both were also related to the differences in marginality in the two areas; and that both were also obviously related to the sociopolitical development at Chaco.

For the Casamero community, the Late Pueblo II period represented the introduction of a Chacoan outlier and road system, perhaps in an attempt to tap into the higher productivity of this productive area in the southern periphery of the San Juan Basin, and/or as an affirmation of the contribution it had already made. Whatever that cause, it was a part of the Chacoan outlier system after A.D. 1020, and it may well be that the sharp downturn in basin-wide productivity from the A.D. 990s to 1020 brought on this connection. It is also likely that the occupation of the more marginal Pierre's scion community after A.D. 1020 was also related to this downturn, perhaps in an attempt to expand the system so as to take advantage of a greater range of environments and/or a larger farming area. The extension of the North Road through the area was also undoubtedly a factor in the creation of the Pierre's community, but for whatever reason it was established, clearly the Chaco people were expanding their system into more marginal areas. Unlike Casamero, the Pierre's environment was not productive enough to allow for a self-sufficient farming community, so outside sources of food and other forms of energy were required, as witnessed by the high frequencies of intrusive ceramics and lithics.

The onset of more marginal conditions after A.D. 1120 and a consequent decrease in productivity could also explain the abandonment of Casamero and the continuation at Pierre's. For the Casamero community, there was other available, productive land for the Ancestral Pueblo people to move to if their farm fields became exhausted. These new areas could have been

elsewhere in the Red Mesa Valley or in immediately adjacent areas, such as at or near the Village of the Great Kivas in the Zuni region, where a Chacoan outlier began in Early Pueblo III times, or in the Acoma area, where there was a sharp and noticeable population increase in the Pilares Phase, after A.D. 1100 (Dittert 1959:75; Tainter and Gillio 1980:Figure 3). In other words, because of nearby available farmland the Casamero population picked up and moved, rather than attempting to cope with the onset of more marginal conditions by expanding trade networks or otherwise bringing in outside sources of energy.

This option does not appear to have been available for the populace of the Pierre's community. They were already at the end of the line in terms of available arable soils and other resources; and instead of moving (which they had already done once to get to the Pierre's area from Chaco Canyon), they tried to stick it out by several techniques discussed below.

Early Pueblo III (A.D. 1120 to 1220)

Sebastian's (1988) reconstruction shows this as a period of progressively deteriorating conditions, except for a short period of improved conditions between A.D. 1180 and 1200. In order to cope with these conditions, the Pierre's outlier occupants continued the same strategies they had used previously. They increased their contacts and trade with outside groups (as shown by a jump in nonlocal ceramic frequencies from 12 to 13 percent in Late Pueblo II times to 16 to 22 percent in Early Pueblo III times, and they attempted to utilize each and every local microenvironment and every available acre of farmland, as shown by the expansion of special use sites and residential sites out from the core road/great house area. These strategies appear to have succeeded for 80 or so years, but after A.D. 1220 the community and its support system collapsed.

In summary, we are viewing the Casamero and Pierre's communities as examples of two different types of outlier complexes–Casamero was an ancestral, pre-Chaco community that evolved into a Chacoan outlier because of its relatively high productivity and location in a nonmarginal environment, while Pierre's was a scion outlier that was established because of its location along the route of the North Road and because it represented an attempt by the population of Chaco Canyon to expand into a more marginal location during a period of stress. Both communities were also abandoned during periods of deteriorating environmental conditions, but the processes were different. At Casamero the population moved to nearby, perhaps more productive locales, while the Pierre's people tried to copy by intensifying their contacts with outside groups and their use of local microenvironments. Ultimately these attempts failed, and the Pierre's area was abandoned, as was the Casamero area before it.

CHAPTER 10

CASAMERO IN THE CHACO WORLD

John Kantner

Casamero is one of the few excavated Chaco-era great houses located outside of Chaco Canyon, making it a critical piece in reconstructing the Chaco puzzle. The valuable work of the archaeologists who have investigated Casamero, and who authored the chapters in this volume, gives us different scales of insight into a great house community, from the intensively studied great house itself to the community in which it was built. Casamero, furthermore, is located in one of the more thoroughly studied areas of the Chaco "World," the Red Mesa Valley. From the detailed surface investigations at the nearby communities of Andrews and Blue J, to the excavations of numerous sites throughout the drainage over the past several decades, a wealth of data has been recovered from the Red Mesa Valley, even if it is not always easy to find or as thorough as one might like. And, of course, the Red Mesa Valley itself and its extensive record of Chaco-era history is just one small part of the enormous Chaco World. This chapter therefore situates the decades of Casamero research within the larger picture of the Chaco "phenomenon," beginning at the scale of the great house itself and then proceeding to the levels of the Casamero community, Casamero's immediate neighbors, the larger Red Mesa Valley, and finally the entire Chaco World.

The Casamero Community

Investigations of the Casamero great house community include not only the Cottonwood Gulch- and Bureau of Land Management-sponsored projects reported in Chapters 2 through 8, but also mitigation projects undertaken by the then-named School of American Research (now the School for Advanced Research). Especially extensive was the School of American Research survey for the Escalante power plant located a short distance from the Casamero great house (Whitmore and Schaafsma 1979). Although these additional projects surveyed areas well outside of the Bureau of Land Management holdings, many of the sites they recorded were almost certainly part of the Casamero community. In 1999, as part of my dissertation research in the Red Mesa Valley, I assembled all of the Archaeological Records Management Section data on surveys completed within and surrounding the Bureau of Land Management area (Kantner 1999a:102-103). Figure 10.1 illustrates both surveyed and unsurveyed areas that I identified, revealing the large swaths of surrounding landscape that have not yet been surveyed, especially to the north of the well-known Casamero great house (LA 8779). However, to the south, and especially to the southwest where the power plant is now located, extensive survey has been conducted.

The combined survey data from inside and outside of the Bureau of Land Management holdings reveal a fairly well-bounded area for the Casamero community, with most sides clustered on the east side of Tecolote Mesa around the Casamero great house and great kiva. The density of habitation decreases rapidly as distance from the great house increases, with small scatterings of one- or two-room field houses scattered across the floor of the Red Mesa Valley. With the additional sites identified outside of the Bureau of Land Management boundaries, the estimates of habitations in use during each time period are one site

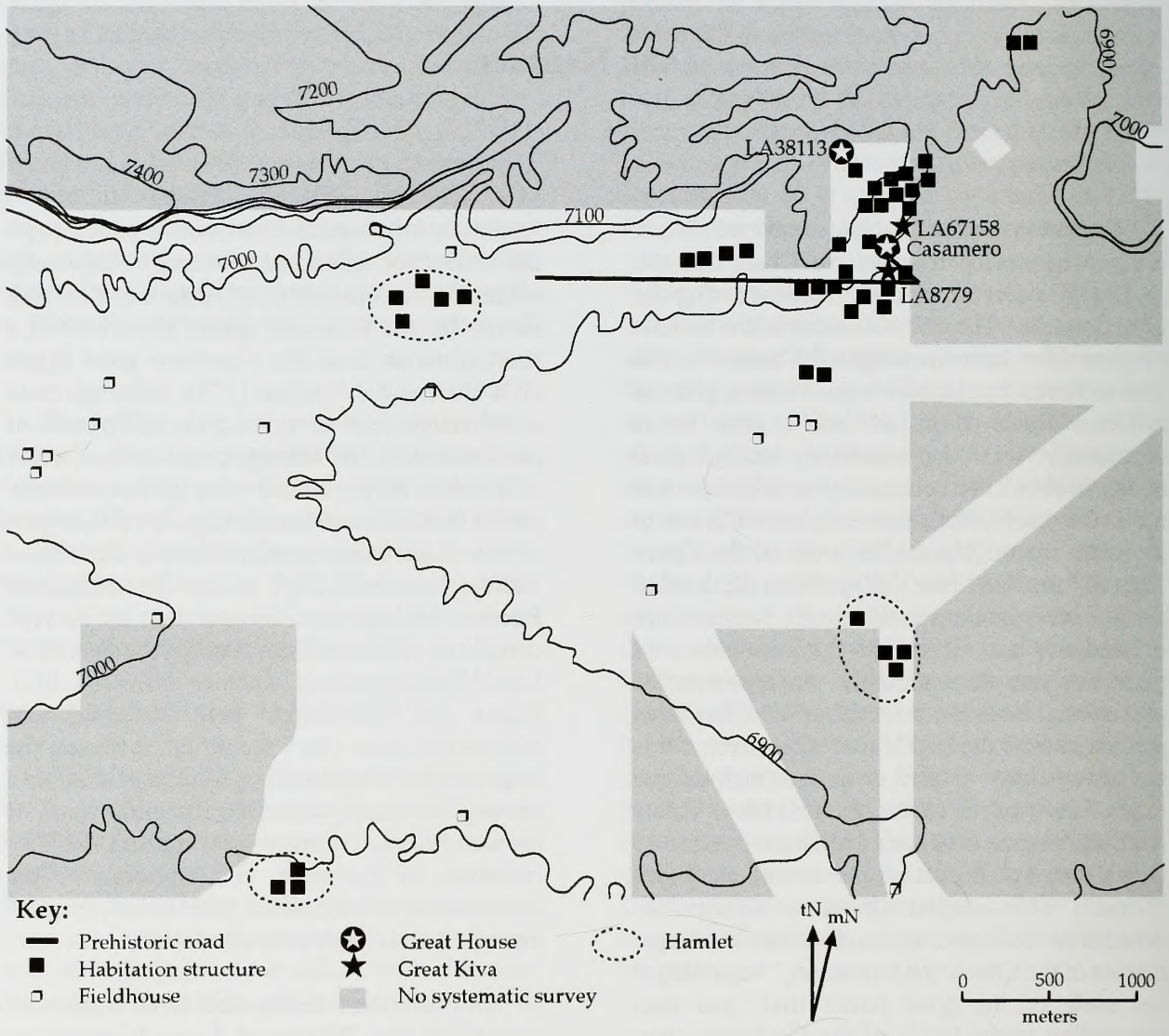

Figure 10.1. Map of the Casamero great house community, showing areas that have received full-coverage survey and the architecture identified by these surveys.

during Basketmaker III, two sites for Pueblo I, 14 sites for Early Pueblo II, 25 sites for Late Pueblo II, and six sites for Early Pueblo III. Although these numbers do not substantially differ from the results of the Bureau of Land Management survey reported in Chapter 6, I did use them to estimate a maximum momentary population of 51 people for the Casamero community during Late Pueblo II (Table 10.1), based on room counts and a habitation use-life of 50 years (Kantner 1999a: 107-108).

My 1999 study of existing records on Casamero, combined with continuing research in the area, calls into question a number of the proposals made in earlier research on the community. First, Marshall et al.'s suggestion (1979:134, 337) that Casamero was established by a group coming from the Andrews great house community on the east side of the Casamero Draw seems unlikely. Although the Andrews community includes great kivas that may date to the A.D. 800s, habitations at Casamero apparently are at least contemporaneous with those at Andrews (Van Dyke 1997a, 1999). More significantly, the Casamero great kiva at LA 67158 includes surface rooms with upright slab architecture that suggests greater antiquity than is normally attributed to the community. The fact that Casamero has access to a modest spring on the west side of Tecolote Mesa, whereas Andrews apparently relied on surface water reservoirs, suggests that the Casamero location would have been preferred over Andrews–in fact, arguing that Andrews was founded by Casamero residents makes more sense than the other way around. The maximum estimate for momentary population at Andrews is 46 during Late Pueblo II (Kantner 1999a:107-108).

A second unresolved issue about the Casamero community is the quantity and dating for its great houses and great kivas. The alleged great kiva at LA 8779 is virtually unknown, and its identity should be confirmed, perhaps with the use of remote sensing equipment such as ground-penetrating radar. The more recently discovered great kiva at LA 67158, noted earlier, remains largely unacknowledged in the recent literature. Even more intriguing is the archaeological record on top of Tecolote Mesa. A complex consisting of a masonry habitation fronted by a large, 11-m depression and associated with nearby slab-lined cists apparently has been recorded multiple times, as LA 38113, LA 50397, and LA 66039. The eight-room surface structure has been pothunted, revealing substantial walls of compound masonry, enough for John Stein and Daisy Levine (1983) to have identified it as a great house in their 1982 investigation. The surface ceramics, however, are all Pueblo I styles. Perhaps Pueblo II ceramics long ago were washed off the mesa, but this scenario seems unlikely considering how far away from the mesa edge the complex is located. This unusual site merits further investigation, for nothing like it has been found above other nearby communities (e.g., Kantner 1999a; Van Dyke 1999, 2000), and certainly a great house-like structure with Pueblo I ceramics in the Red Mesa Valley would cause archaeologists to reconsider how the Chaco phenomenon developed.

A similar issue is the sequence of use at LA 8779, the excavated Casamero great house. Previous discussions have emphasized the tree-ring dates from the middle to late eleventh century (e.g., Chapters 4 and 5), while the presence of earlier ceramic styles such as Red Mesa are dismissed as older sherds recycled as wall chinking or as having been washed in from older middens–despite the fact that intact Red Mesa vessels were also recovered from the structure. The excavations clearly revealed that a considerable amount of remodeling took place at the great house, as attested to by the division of what was once a long "hallway" into Rooms 6, 8, and 10; the blocked-in kiva also was likely remodeled. My own reanalysis of sherds from the trash-filled rooms at LA 8779 indicates a mean ceramic date of A.D. 1061; but with a considerable statistical range of A.D. 984-1138 created by the large number of older styles,

Table 10.1. Information on great house communities in the Red Mesa Valley.

	Great Houses			Community			
Community Name	Name	Features	Dates	No. of Great Kivas	No. of Habitations	Date Range	Maximum Population
Casamero Draw							
Casamero	Casamero	29 rooms, 1 kiva	A.D. 984-1138	2-3	28	A.D. 655-1158	51
	LA 38113?	8 rooms, 0 kiva	?				
Kin Sani	Kin Sani	12 rooms, 1 kiva	A.D. 995-1111	0	49	A.D. 954-1111	98
	Kin Niiyahk'eed	9 rooms, 2 kivas	A.D. 995-1111				
Coyotes Sing Here	Coyotes Sing Here	20 rooms, 2 kivas	A.D. 990-1081	?	?	?	?
Blue J	None identified	N/A	N/A	0	55	A.D. 777-1149	132
Andrews	Andrews	22 rooms, 2 kivas	A.D. 986-1078	4	28	A.D. 902-1117	46
Red Mesa Valley							
Coolidge	Coolidge East	11 rooms, 1 kiva	A.D. 1013-1096	2	?	?	?
	Coolidge West	18 rooms, 3 kivas	A.D. 998-1106				
Tse Bee Kintsoh	Tse Bee Kintsoh	30 rooms, 2 kivas	A.D. 965-1132	4	79	A.D. 754-1135	161
	LA 51382	12 rooms, 1 kiva	A.D. 923-1112				
	Kin Henio	?	A.D. 1052-1090				
Haystack	Haystack	29 rooms, 3 kivas	A.D. 1038-1100	5	>23	A.D. 929-1130	?
	LA 12573A	20 rooms, 1 kiva	A.D. 977-1078				
	Kin Tl'iish	17 rooms, 1 kiva	A.D. 1001-1146				

including 15 percent Red Mesa and 3 percent Kiatuthlanna. A reasonable date of initial construction for LA 8779 is the early A.D. 1000s. Considering the later remodeling of the structure, whether the later residential function for the great house also characterized its initial use cannot be determined, but the long entrance hall, the special features of Room 12, and the blocked-in kiva attest to an initial ceremonial focus. Perhaps later it was remodeled for domestic use, accounting for the late tree-ring dates.

One of the arguments made for the late construction of LA 8779, the Casamero great house, is that it could not have been built before Chaco Canyon was experiencing influence from the Mesa Verde/San Juan area. This of course assumes both that at least some features of LA 8779 are "Mesa Verdean" and that the great house was built under a direct mandate from Chaco Canyon. Neither argument seems to be supported by newer evidence from the immediate region, nor by changing views on the relationship between Chaco Canyon and the Mesa Verde/San Juan region (e.g., Wilshusen and Van Dyke 2006). First, the kiva style at LA 8779, with a keyhole niche, historically has been defined as a northern tradition. However, this style is actually quite common in the Red Mesa Valley; both kivas excavated in the Blue J community to the northeast of Casamero were keyhole kivas, with the one tested by Georgia State University radiocarbon dated within the A.D. 790-1030 range. Furthermore, the overall architectural style of LA 8779, with its rectilinear L-shaped layout, is very common locally, with only the narrow core-veneer walls providing any link to Chaco Canyon. As is discussed in much of the recent literature on Chaco-era great houses (e.g, Kantner and Kintigh 2006; Kantner and Mahoney 2000), the presence of Chacoan architectural features could have occurred through many social, cultural, and political mechanisms other than direct guidance by Chaco Canyon architects. Neither a tcamahia floating in room fill (Chapter 4), nor a selective assessment of standardized measurements (Chapter 5), provide compelling evidence for Mesa Verde-style-bearing architects from Chaco Canyon being present in the Casamero community.

Casamero in the Red Mesa Valley

The Casamero great house community is one of several located in the Red Mesa Valley. Along the Casamero Draw itself are three others, while three more are found adjacent to the Rio San Jose in the main valley bottom. Few sites have received more than a cursory examination by archaeologists, but a combination of contemporary community surveys (e.g., Van Dyke 1997a, 1999), selective excavations by Gladwin and others (Gladwin 1945; Smith 1965), as well as corridor mitigation projects (Alexander 1964; Smith 1964; Wendorf et al. 1956), provide a valuable if uneven wealth of information on the Ancestral Pueblo history of the area. In general, settlement of the area concentrated around springs and washes on the north side of the Red Mesa Valley, leading to the emergence of modestly sized communities like Casamero, whose residents eventually constructed one or more great houses (Figure 10.2). Beyond these larger villages, especially on the south side of the Red Mesa Valley at the base of the Zuni Mountains, were many scattered households, some clustered in small "hamlets" (Kantner 1996b). Great houses were apparently never constructed among these habitations.

A brief review of the work conducted on Red Mesa Valley great house communities situates Casamero in the surrounding human landscape during the Chaco era. Discussion first focuses on the nearby communities in the Casamero Draw before exploring the more distant communities found along the north side of the Rio San Jose, against the namesake cliffs of the Red Mesa Valley.

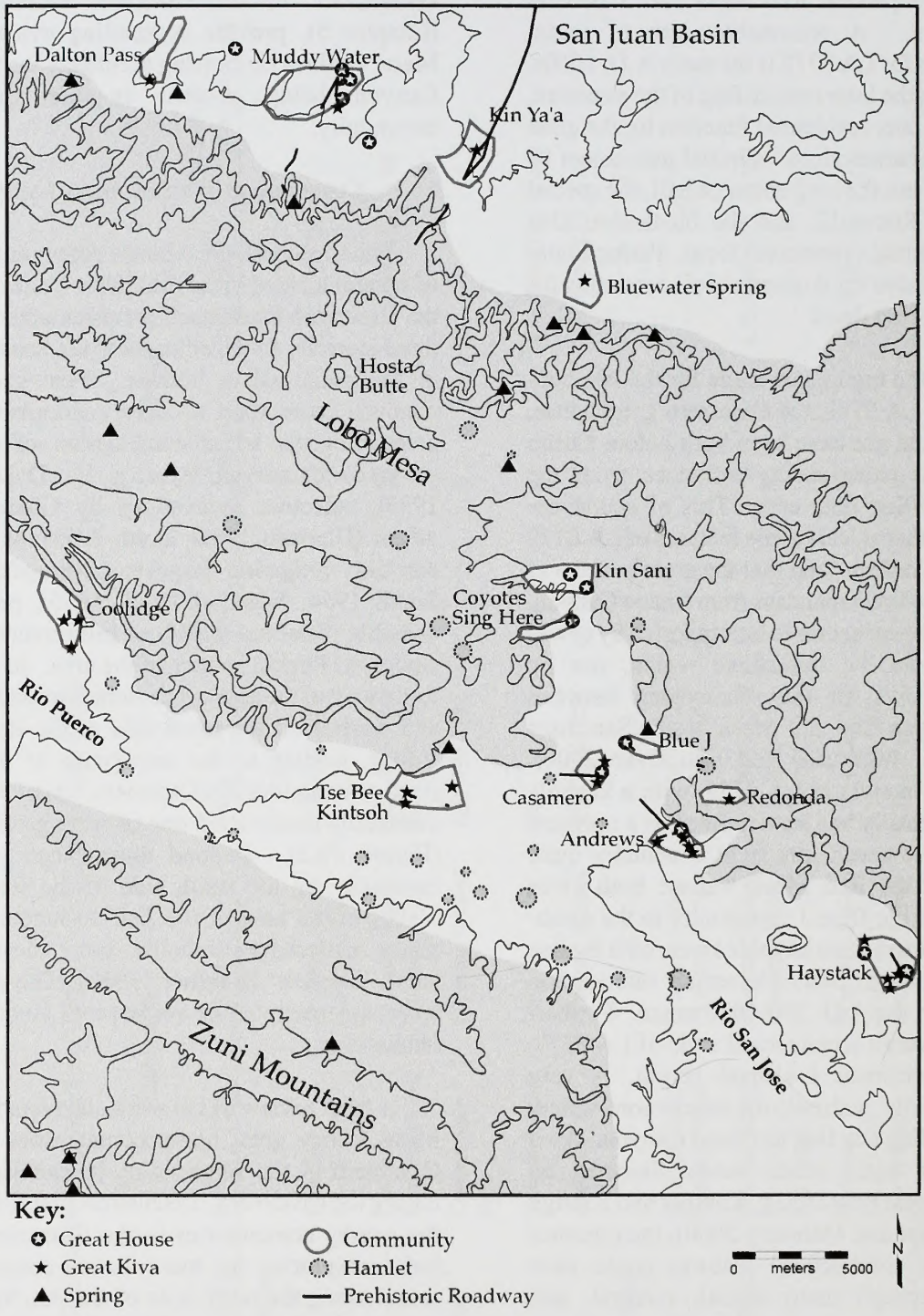

Figure 10.2. Map of the Red Mesa Valley, showing great house communities and site distributions described this chapter.

Great House Communities in Casamero Draw

Located at the head of Casamero Draw, approximately 8 km north of Casamero itself, lies the Kin Sani great house community. Research on Kin Sani includes a Museum of New Mexico survey for Gulf Oil in 1972, a water line survey conducted by Northern Arizona University in the early 1980s, and a power line survey reported by the Navajo Nation Archaeology Department in 1987 (Judges 1982; Copeland 1987). Habitations in Kin Sani appear to be concentrated in two clusters, each associated with a great house. Mean ceramic dating for the nearly 50 habitations indicates a community occupation span from A.D. 954-1111, with a maximum momentary population in Late Pueblo II (Table 10.1). The two great houses are each named: Kin Sani is a single-story structure of apparently 12 rooms and one kiva, while Kin Niiyahk'eed is very similar, with nine rooms and two kivas in one story. Ceramics from both great houses suggest a use between A.D. 995-1111. A short road segment and associated steps ascend a small mesa to provide access to Kin Niiyahk'eed. No great kivas have been identified in this community (Kantner 1999:100-101).

The Kin Sani community is situated close enough to the Coyotes Sing Here great house that one could argue that they are part of one large community (Figure 10.2). However, the still-unrecorded habitations of Coyotes Sing Here are reportedly concentrated west of the great house, and a void of about 1.5 km appears to separate the two communities. The only research conducted at Coyotes Sing Here was done by Marshall et al. (1979:145-157); it focused exclusively on the great house. This two-story structure includes 20 rooms and two kivas, and several low exterior walls surround the great house, suggesting the presence of at least one enclosed plaza (Table 10.1). Mean ceramic dating suggests that use of the structure spanned from A.D. 990-1081 (Kantner 1999a:100).

Blue J is the name given to a community southeast of Coyotes Sing Here and northeast of Casamero (Figure 10.2). In the middle and late 1970s, several poorly reported projects were conducted in various portions of the community by Willam Harrison of Western Michigan University. Harrison's early projects consisted of railway corridor surveys conducted for the Santa Fe Railway and the excavation of one of the habitations. Very few records of this work have been found, although the artifacts from the excavations were stored in the basement of a mining museum. In the early 1980s, Harrison was hired by rancher Henry Andrews to evaluate the potential of turning Blue J (which he called "Red Mesa Terrace") into a private archaeological park, but all that remains of this investigation is a letter to Mr. Andrews summarizing the work. Until 2000, the only other research conducted in this community consisted of an examination of a structure in 1982 by Daisy Levine and John Stein, who believed it to be a great house due to the mound height and gave it the name "Blue J" based on its "J" shape and its limestone construction, which contrasted with the sandstone used in nearby households (Nials et al. 1987:150-153).

In 1998, I acquired the surviving materials from Harrison's excavations, and in 2000, I began resurveying the community. This work was conducted under the auspices of Georgia State University with funding from the National Science Foundation and has included sub-surface work at several of the structures. Research on Blue J is continuing at the School for Advanced Research. Pedestrian survey of the community and surrounding area was completed in the 2004 season, yielding almost 75 distinct sites, over 50 of which are surface structures ranging from one to 35 rooms. Preliminary ceramic analyses from surface collections are complete and mean ceramic dates established for each site. This provides a working model of how the community developed. A handful of sites yielded early ceramics, suggesting that use of the Blue J area began in the late seventh century A.D. near the large spring in the heart of the community. By the

eleventh century, Blue J had grown substantially larger than the neighboring communities of Casamero and Andrews, with a maximum momentary population estimate exceeding 130 people. Testing of the heavily pothunted "great house," however, revealed that it was actually a modest domestic structure with unremarkable architecture, with the exception of a single room added late in its sequence that was made of core-veneer masonry. In fact, despite extensive searching, no legitimate great house and no great kivas were found in this large community.

Located a few kilometers to the southeast of Casamero lies the small great house community of Andrews (Figure 10.2, Table 10.1). Research at Andrews began with Marshall et al.'s (1979) outlier study in the late 1970s. This was followed by a survey for a railroad spur line reported by Hogan and Sebastian (1983). Fred Nials et al. (1987:151-153) also examined the community to evaluate the segments of prehistory road found there, which appear to have connected habitation clusters with one another as well as to have maintained a linear orientation with Hosta Butte (Kantner 1997). More recently, Ruth Van Dyke conducted a detailed study of both the community and the great house as part of her dissertation research (Van Dyke 1996, 1997a, 1997b, 1999, 2000).

According to Van Dyke's research, the Andrews community consists of 44 structures in use from A.D. 882-1053. My own mean ceramic dating includes a comparable range of A.D. 902-1117 (Table 10.1), based on data only from the 28 habitations (excluding the public structures and one-room fieldhouses that Van Dyke considers in her dates for the community). These habitations are concentrated into at least two and possibly three clusters, one or two situated along the base of a mesa, while another is located farther out in the flat bottom of Casamero Draw. Also found in this community are a great house and four great kivas. The Andrews great house is a 22-room, two-story structure that contains two blocked-in kivas, three small kivas in a plaza, and a nearby great kiva. My mean ceramic dates suggest an occupation from A.D. 986-1078, while Van Dyke's ceramic dates from nearby middens range from A.D. 919±56 to 1017±90, with the midden closest to the great house suggesting an occupation from A.D. 927-1107 (Van Dyke 1997a). The three great kivas not associated with the great house are dispersed throughout the community; whether they are contemporaneous with the great house and with one another is unclear, although my mean ceramic dates suggest that they are (Kantner 1999a,:103-105).

Great House Communities in the Red Mesa Valley

Situated just east of the Continental Divide at the headwaters of the Rio San Jose (Figure 10.2), the Coolidge great house community consists of two great houses, two great kivas, and an unknown number of habitations. Very little research has been conducted in Coolidge. Some of the structures excavated by Gladwin (1945) are likely associated with Coolidge, but his publications do not provide locational information. Marshall et al. (1979:141-144) investigated the great houses, great kivas, and associated features, but they recorded almost none of the habitations that they reportedly saw in the area. A few structures were examined during a water line survey conducted by Northern Arizona University around 1980 (Strand 1980). Those domestic structures that have been investigated exhibit mean ceramic dates suggesting an occupation between A.D. 878-1118, with the earliest date coming from two pithouses that underlie a Pueblo II habitation. Also associated with the community is a possible reservoir pool and catchment swale south of the great houses and a prehistoric road that reportedly ascends Lobo Mesa to the north.

The Coolidge great houses are located directly adjacent to one another and appear to have been occupied contemporaneously (Table 10.1). Mean ceramic dates indicate occupation ranges of A.D.

998-1106 for the western structure and A.D. 1013-1096) for the eastern great house. The former is two stories and contains 18 rooms and three kivas, while the east structure contains 11 rooms and one kiva. A second prehistoric road appears to link the great houses with two great kivas located 165 m to the south. One of these kivas reportedly dated to Pueblo I, but mean ceramic dates derived from reported samples indicate that they are contemporaneous with one another and with the great houses (Kantner 1999:96-97).

Tse Bee Kintsoh is one of the larger communities in the Red Mesa Valley (Figure 10.2; Table 10.1). Surveys have identified several clustered groups of habitations associated with three great houses, four great kivas, and two short prehistoric road segments. Our knowledge of this community derives primarily from three investigations: two pipeline surveys conducted in the mid- and late-1970s by the Office of Contract Archeology at the University of New Mexico (Gauthier and Stein 1997; Miller and Frizell 1980) and a more detailed study by the Navajo Nation Cultural Resource Management Program (Copeland 1985).

Almost 80 habitations have been identified at Tse Bee Kintsoh, as well as evidence for over a dozen pithouses (Table 10.1). Ceramics recorded in the community reveal a lengthy occupation span from A.D. 754-1135, with a maximum estimate for momentary population of 161 in Late Pueblo II (Kantner 1999:108). The three great houses in Tse Bee Kintsoh appear to be contemporaneous. The largest, named after the community, contains 30 rooms and two kivas in two stories. Mean ceramic dates for this structure suggest an occupation between A.D. 965-1132. Two of the great kivas, which also date to Pueblo II, are connected to this great house with a short prehistoric road. The second great house, LA 51382, is one story and contains 12 rooms and a single kiva. Ceramics suggest an occupation range of A.D. 923-1112. A few hundred meters away is an Early Pueblo II great kiva. The single-story Kin Henio, which is eroding into an arroyo, reportedly contained eight rooms and an unknown number of kivas in the 1980s, but even then it had been heavily damaged; its current condition is unknown (Kantner 1999:97-100).

On the far eastern edge of the Red Mesa Valley, before it opens into the Mt. Taylor-El Malpais area, is the Haystack great house community (Figure 10.2). Unfortunately, although a number of archaeological investigations have occurred at Haystack, none of them have included extensive surveys, leaving much of the community undocumented. The evidence so far suggests that Haystack consists of at least 23 habitations occupied from A.D. 970-1130, according to mean ceramic dating (Table 10.1). Three great houses and five great kivas are also found scattered throughout this community. Research at Haystack dates back to 1975, when Stewart Peckham of the Museum of New Mexico recorded several sites in the area. A few years later, an investigation of the great houses and great kivas by Marshall et al. (1979) was conducted. More recently, a transmission-line survey was conducted by Rio Abajo Archaeological Services (Gossett and Gossett 1983); Northern Arizona University identified a habitation and pithouse in the mid-1980s (Fairley 1984); and John Stein located one of the great houses, Kin Tl'iish, in 1988. I conducted brief test excavations of this great house and a nearby habitation in 1995 (Kantner 1996a).

The best-known great house in the Haystack community is LA 6022, which is more commonly known as Haystack and after which the community was named. This three-story structure contains 29 rooms, three blocked-in kivas, and a fourth small kiva in a walled-in plaza. Also incorporated into the complex is a 19-m great kiva. Mean ceramic dates from this structure suggest an occupation range of A.D. 1038-1100. Another suspected great house, LA 12573A, was probably two stories and contained 20 rooms and a blocked-in kiva; a great kiva is located a short

distance away. Ceramics from this structure indicate a range of use from A.D. 970-1078. The third great house, Kin Tl'iish, contains 17 rooms in two stories, as well as a blocked-in kiva, a separate small kiva, and a nearby great kiva. It dates to A.D. 1001-1146. In addition to these three great house/great kiva complexes, two separate great kivas have been identified in this expansive community.

Casamero and Its Neighbors

Because few of the other Casamero Draw and Red Mesa Valley communities have received more than cursory investigation, it is difficult to draw conclusions from a comparison of Casamero with its neighbors. The Casamero great house (LA 8779) itself is quite similar to great houses found in nearby communities (Table 10.1). With the smallest great house in the area containing nine rooms in one story and the largest featuring 30 rooms in two stories, Casamero is relatively average in size. It should be noted that because the Casamero great house has been fully excavated, unlike any of the others, its room count is higher than surface indications would have shown prior to excavation, due to all of the small "rooms" around the blocked-in kiva. This underestimating of room counts based on surface indications is a frequent problem in the area due to the placement of so many sites against rapidly eroding sandstone cliffs.

Very little analysis of material culture at area great house sites has been conducted, but grab samples from survey investigations identify consistently high frequencies of local ceramics and lithics, with imported material culture in the 10 to 15 percent range and dominated by White Mountain Redwares and distant obsidians. Turquoise and shell are routinely identified at great house sites, but systematic counts are rare. Fewer than a dozen ornaments–and an unknown number of unmodified pieces–were recovered during excavations of the Casamero great house (Chapters 4 and 5). One important pattern to note is that great houses are seemingly not unique in their frequencies of imported materials; excavations in the non-great house community of Blue J routinely recovered turquoise and shell ornamental materials comparable to those found at the Casamero great house, while a former landowner of the Andrews community claimed that "bags" of turquoise were collected from these sites (Mathien 1985, 1997; see also Switzer 1970). Such high frequencies of turquoise are consistent with reports that turquoise deposits may have once existed in the nearby Zuni Mountains (Green 1990:89); certainly the presence of historic copper mines, and azurite and malachite deposits, are consistent with this claim. In general, however, Red Mesa Valley great houses appear not to exhibit exceptionally high frequencies of imported materials or prestige items, although this area of inquiry merits much more attention in future investigations.

One of the many unresolved questions about the Casamero community and its neighbors is what forms of interaction occurred among them. Momentary population estimates for each community suggest a demographic setting in which regular inter-marriage would have been beneficial (Wobst 1975), although no positive evidence of such linkages is yet available. Research conducted on ceramics recovered from area great houses and habitations, however, provides some insight into intercommunity interaction. A compositional analysis of local Gallup Black-on-white ceramics from the Casamero, Blue J, and Haystack communities used X-ray fluorescence to identify where the original vessels had been produced (Kantner et al. 2000). This information was considered to be a useful proxy for measuring exchange–and thus interaction–between the three communities. The results suggested that 50 to 55 percent of the sherds were produced in the communities in which they were recovered, while 35 to 40 percent originated in other Red Mesa Valley communities, suggesting a high level of exchange. Such interaction, however, was not even across the region; the habitation sampled in

Blue J, for example, appeared to exchange more ceramics with distant Haystack than with its immediate neighbors at Casamero (Kantner et al. 2000).

A related investigation of ceramics from Casamero, Blue J, and Haystack considered stylistic variability within and among communities, focusing on both passive and active stylistic elements on Red Mesa and Gallup sherds (Kantner 1999a:Chapter 7). This study identified consistent stylistic variability within each of the communities but stylistic homogeneity among them, suggesting the presence of numerous learning communities–perhaps kin groups–that may have been distributed across community boundaries. This pattern in the greater Red Mesa Valley was especially apparent when compared with a selection of larger and physically more centralized great house communities–Muddy Water and Kin Ya'a–located to the north of the Dutton Plateau. These results are consistent with the regular interaction attested to by the compositional analysis, again suggesting that communities such as Casamero were part of a vibrant sociopolitical landscape.

The Chaco World

The great house communities of Casamero Draw and the Red Mesa Valley represent a tiny fraction of the greater Chaco World. Several recent discussions of great house communities outside of Chaco Canyon have appeared in print (e.g., Durand 2003; Gilpin 2003; Kantner 2003b; Kantner and Kintigh 2006; Kantner and Mahoney 2000; Kintigh 2003; Van Dyke 2003), most having originated in a 1999 Chaco World Conference held at Arizona State University, one of the topic seminars in the National Park Service Chaco Synthesis series. Organized by Nancy Mahoney, Keith Kintigh, and myself, the conference's discussions revolved around a large database consisting of information on almost 250 likely Chaco-style great houses and the Ancestral Pueblo communities in which they are located. Details on the conference and the Chaco World Database are available in Kantner (2003a) and Kantner and Kintigh (2006); some of the preliminary conclusions from this ongoing work are summarized here.

Spatial and Temporal Patterns of the Chaco World

One of the clearest patterns resulting from an assessment of the distribution of great house communities is that Chaco Canyon is not the center of the Chaco World (Figure 10.3), nor was it ever in the center, as has often been directly or indirectly claimed. Instead, the vast majority of Chaco-era great houses are located to the west of the canyon, with the eastern communities of Chimney Rock and Guadalupe literally "outliers" located well beyond their closest great house neighbors. This distribution, furthermore, did not form all at once; instead, the boundaries of the Chaco World grew and changed remarkably over time. Casamero and its neighbors were part of an evolving socio-political landscape in which Chaco Canyon was only one of many players.

The evidence, tentative as it is, suggests that the first Chaco-like public structures appeared at places like Willow Canyon and Padilla Well in the late A.D. 700s, well before true "Chaco" features emerged in Chaco Canyon itself. These above-ground, open public spaces with minimal architecture, however, look little like later Chaco architectural complexes, and so some scholars have looked elsewhere for sources of great house architecture (e.g., Lipe 2006; Wilshusen and Van Dyke 2006), making the proto-Chaco features and Pueblo I dating of LA 38113 on Tecolote Mesa even more curious. But no matter what their genesis, by the late A.D. 800s, distinctive Chaco architectural traits emerged in and immediately around Chaco Canyon in places such as Pueblo Bonito, Peñasco Blanco, Una Vida, Kin Nahasbas, Casa del Rio, and the East Community (Lekson et al. 2006; Windes 2001; Windes and Ford 1996). At least in some cases, these complexes

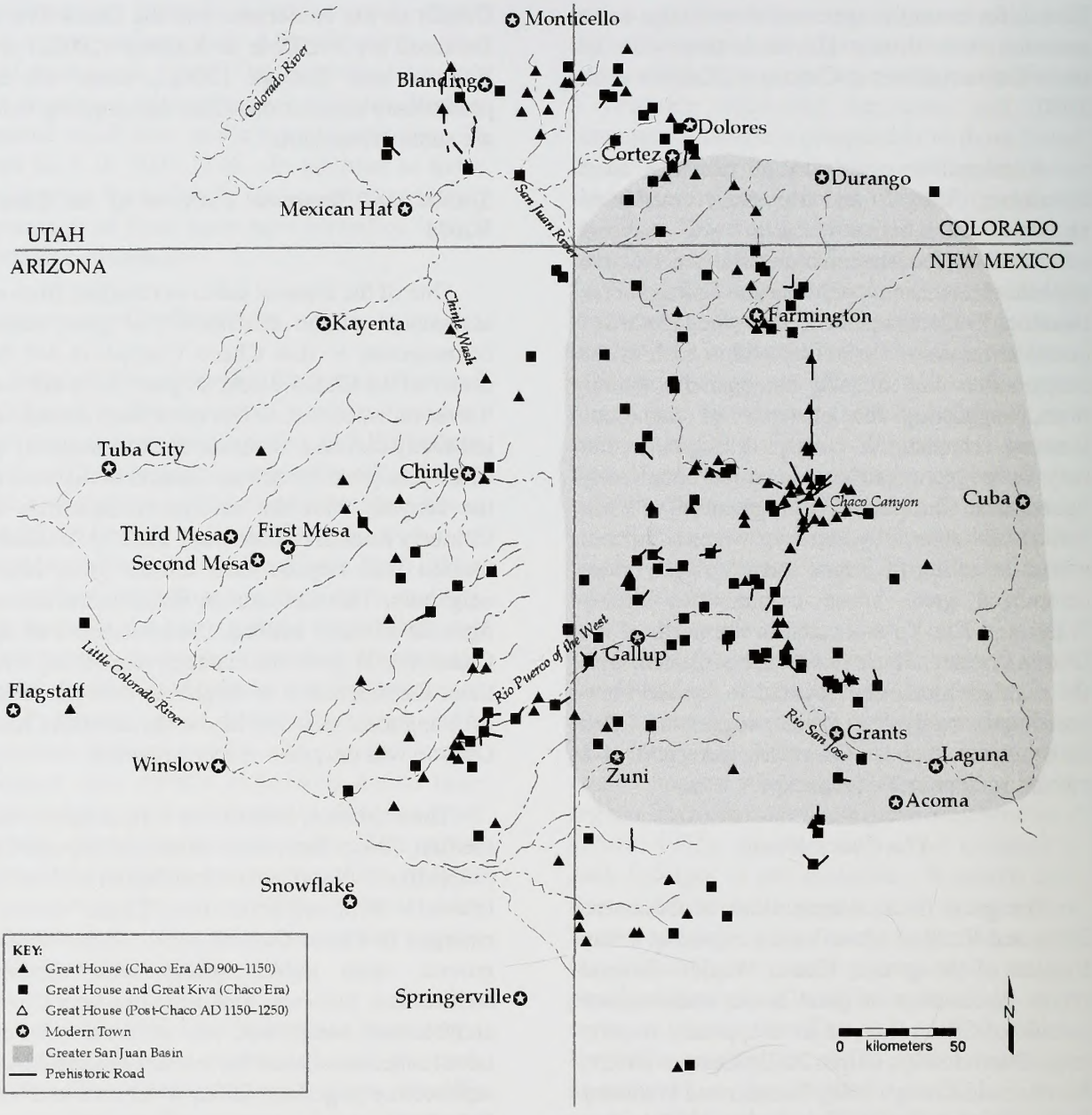

Figure 10.3. Great house architecture in the Chaco World, as defined during the 1999 Chaco World Conference described in the text.

supplanted earlier public structures. At Padilla Well, for example, core-veneer masonry and an enclosed plaza were eventually added to the Pueblo I complex, although exactly when these features were added is unknown. The same process occurred at Casa del Rio, where an early Chaco-style great house was built over a large U-shaped structure dating back to Pueblo I (Windes 2001:42).

According to the Chaco World Database, Chaco features were elaborated in areas immediately surrounding Chaco Canyon sooner than in other, more distant regions. The features then apparently spread to the southern San Juan Basin in the late A.D. 920s to the 940s (Figure 10.4). The South Road from Chaco Canyon to Hosta Butte also may date to this century (Kincaid 1983:9-34-9-46; but see Windes 1991:125-126). As Vivian has suggested (Vivian 1990; Wilshusen and Van Dyke 1006), the southern area probably had historical and social ties to Chaco Canyon, providing opportunities for the sharing of Chaco patterns. Interestingly, while this spread of Chaco influence towards the south occurred during a brief down-turn in climatic conditions, the appearance of these earliest outlying great houses is not correlated with a shift from low to high spatial variability, which occurred a decade later. This is inconsistent with views that see the development of the Chaco World as an adaptive response to spatial climatic instability (e.g., Dean 1992), although better data are needed to be certain of any temporal correlations.

Chaco features seem to have spread relatively quickly according to geography: through the Red Mesa Valley drainage in the latter half of the tenth century, up the Chuska slope by the turn of the eleventh century and perhaps earlier, and into the San Juan River area mostly in the mid-1000s and later (Lipe 2006). Areas along the inner edge of the San Juan Basin exhibited Chaco patterns first and with the highest fidelity (Figure 10.5). Communities well outside of the basin tended to build great houses much later and with less accurate replication of Chaco features (Figures 10.4 and 10.5), suggesting local attempts to copy the great house form with varying results (Gilpin 2003; Van Dyke 2003). Van Dyke (2003) further notes, however, that while the fidelity of great houses in the San Juan Basin was high, great kivas were less often built there during the Chaco era, suggesting that the canyon itself may have supplanted or usurped the ceremonial functions of the ancestral great kiva form. In any case, big bursts of great house construction in all areas occurred in the latter half of the eleventh century, such that by the turn of the twelfth century, the greatest number was actively in use. Numerous road segments also were constructed during these decades, although notions of a Chaco World-wide road system outside of the San Juan Basin have been largely discredited (Kantner 1997; Roney 1992; Vivian 1997); the only continuous roadways are those from Chaco Canyon to the geographical edges of the San Juan Basin, and not beyond.

The frequency of goods imported into Chaco Canyon show some rough correlations with the appearance of great houses in specific outlying areas (Kantner and Kintigh 2006; Toll 2006). The increase in ornaments of non-local materials, especially shell and turquoise, seem to increase in the same decades that great houses were built in areas south of Chaco Canyon. Unclear is whether this is accompanied by the import of basic commodities such as pottery from these areas, particularly because southern pottery with its sherd and sand temper is not easily distinguished from vessels produced elsewhere. Narbona Pass chert (formerly Washington Pass chert) is imported into Chaco Canyon in small quantities at about the same time that great houses appear on the Chuska Slope; in the following decades, both the number of great houses in this area and the frequency of the chert into the canyon increase. Interestingly, the import of Chuskan pottery into Chaco did not reach a height until much later, in the early A.D. 1100s, when many outlying great houses were just beginning to be abandoned.

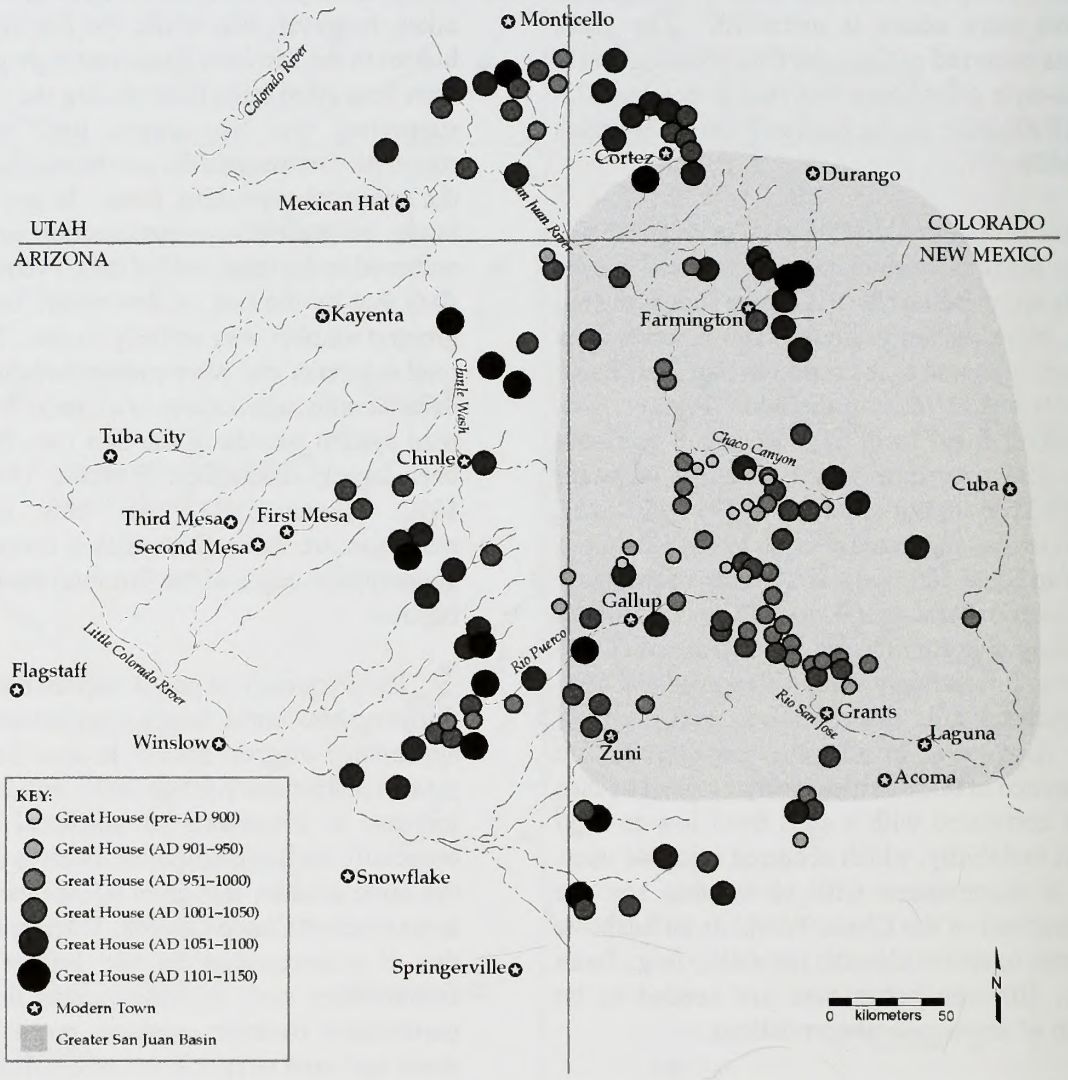

Figure 10.4. Estimated construction dates for great house architecture in the Chaco World. The figure includes only those great houses for which dates are available.

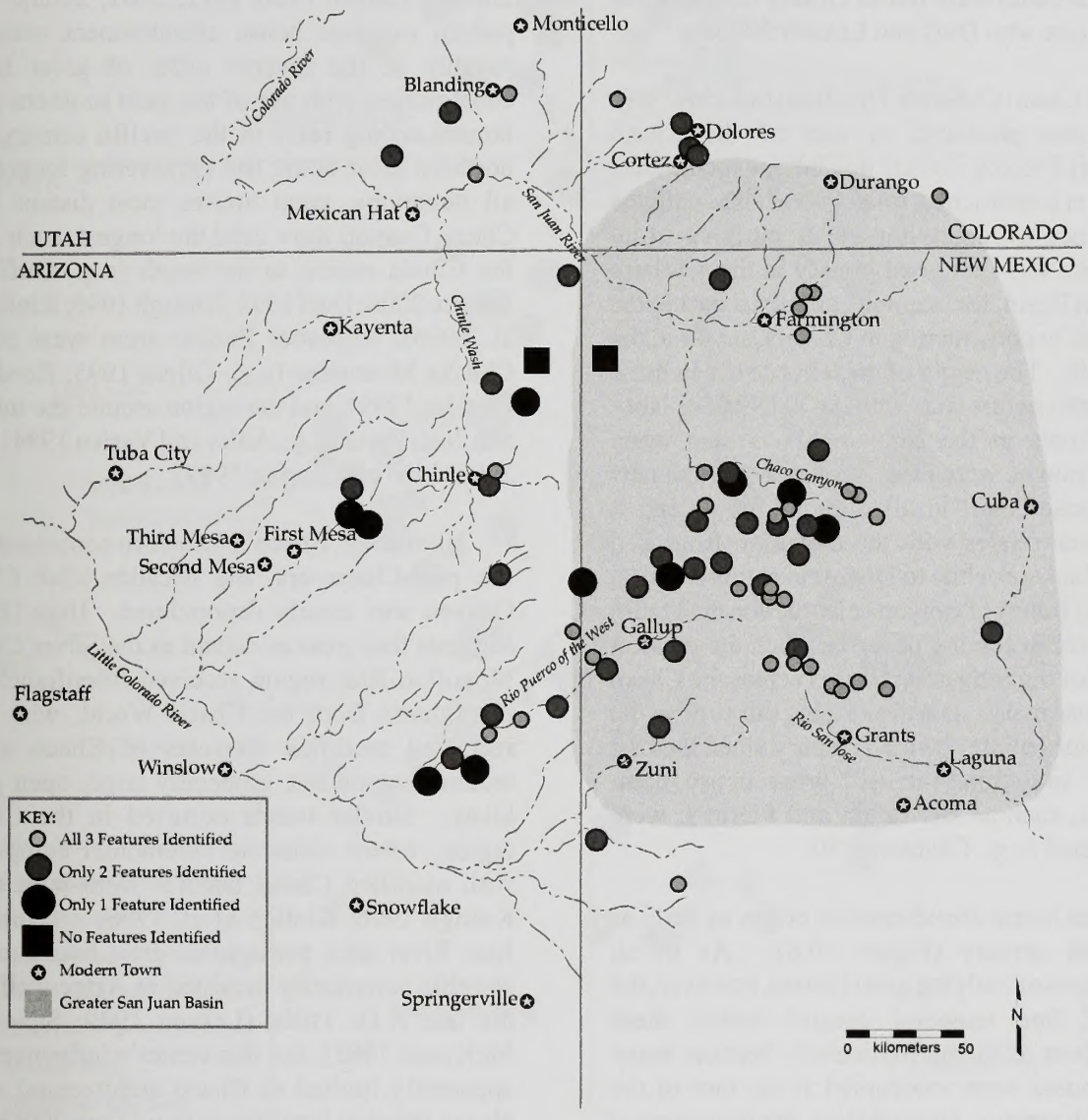

Figure 10.5. The number of Chacoan features identified at great houses for which complete data are available. Only those three features most often associated with Chacoan architecture are considered: core-veneer masonry, multiple stories, and blocked-in kivas.

Studies of the movement of materials into and out of Chaco Canyon (e.g., Kantner et al. 2000) suggest that great house communities beyond the San Juan Basin were not as closely tied with the canyon (see also Duff and Lekson 2006).

The Chaco Capstone Timeline (Lekson 2006), which was produced as part of the Chaco Synthesis Project, reveals that labor expenditures in canyon construction roughly correlate with the appearance of great houses in outlying communities. The first great houses in the southern San Juan Basin, for example, appeared during the first peak in construction in Chaco Canyon in the A.D. 900s. The height of great house use in these areas further correlates with the A.D. 1050s labor expenditures in the canyon–this is also when Chaco features were most frequently seen in new great houses built in all outlying areas, and it roughly correlates with the transition from Red Mesa Black-on-white to Dogoszhi ceramic styles. The final frenzy of canyon construction at the turn of the twelfth century occurred when the greatest number of outlying great houses across the Chaco World was in use. It is also during this time in the last decades of the eleventh century when the first "scion" and "road-related" great house communities, such as Bis sa'ani and Pierre's, were constructed (e.g., Chapters 7-9).

Great house abandonments began as early as the tenth century (Figure 10.6). As in all discussions of outlying great houses, however, the lack of fine temporal control makes these conclusions tentative, particularly because many great houses were reoccupied at the turn of the thirteenth century. Nevertheless, the frequency of abandonment was clearly greatest in the first half of the twelfth century, perhaps as a result of the sustained dry conditions at the turn of the A.D.1100s. Brief as this drought was, it was worse than earlier ones and it occurred when Chaco Canyon required the greatest quantity of resources and labor from the Chaco World–this is when the North Road was constructed (Windes 1991), when the greatest amount of labor was invested in great house architecture (Lekson 1984; Lekson et al. 2006; Windes and Ford 1996), and when the largest quantities of pottery were coming into the canyon (Toll 1991, 2001, 2006). The pattern of great house abandonment occurred roughly in the reverse order of great house construction, with use of the most southern great houses ending early in the twelfth century and northern great house use persevering longer. In all directions, great houses most distant from Chaco Canyon were used the longest, such as in the Cibola region to the south (e.g., Duff and Lekson 2006; Duff 1994; Kintigh 1996; Kintigh et al. 1996), Ancestral Pueblo areas west of the Chuska Mountains (e.g., Gilpin 1995; Reed and Hensler 1999), and the region around the middle San Juan River (e.g., Adler and Varien 1994; Lipe 2006; Lipe and Varien 1999).

Ultimately, Chaco's influence continued into the post-Chaco era, the decades after Chaco Canyon was mostly depopulated. Herr (2001) suggests that areas as distant as the Silver Creek-Mogollon Rim region received disenfranchised immigrants from the Chaco World, who then recreated modified elements of Chaco architectural complexes, especially large, open great kivas. Similar trends occurred in the Cibola region, where elaborate ceremonial complexes with modified Chaco features were built (e.g., Kintigh 1996; Kintigh et al. 1996). In the San Juan River area, perhaps six great houses and a sizeable community persisted at Aztec well into the late A.D. 1100s (Lekson 1999; Stein and McKenna 1988), but this center's influence was apparently limited as Chaco architectural complexes faded in importance (e.g., Lipe 2006). As Toll (2006:130-131) describes, the quantities of imported commodities and exotic items at Aztec were minuscule compared to the flow of goods into Chaco Canyon at its height in the eleventh century. By the middle of the twelfth century, while modified versions of the great house and great kiva forms persevered, their use and meaning were purely local. The Chaco World, which spread across vast swaths of the northern

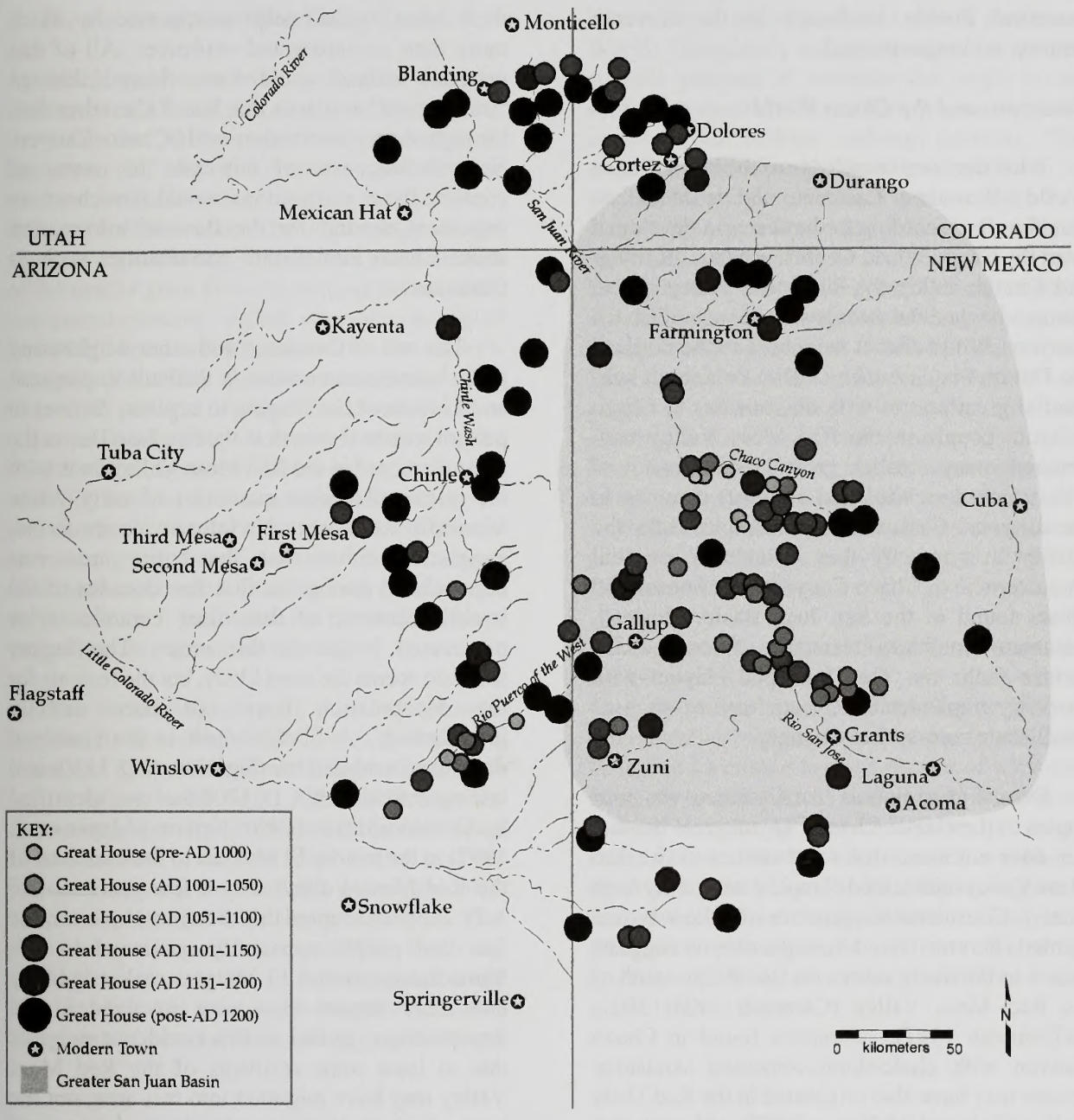

Figure 10.6. Estimated abandonment dates for the great house architecture in the Chaco World. This figure includes only those great houses for which dates are available.

Ancestral Pueblo landscape in the eleventh century, no longer existed.

Casamero and the Chaco World

What does our knowledge of the larger Chaco World tell us about Casamero and its immediate neighbors? According to the scenario developed from the Chaco World Conference (e.g., Kantner and Kintigh 2006), the Red Mesa Valley was in the area beyond the strongest influence of Chaco Canyon. While distant neighbors to the north of the Dutton Plateau, such as Kin Ya'a, built substantial great houses with obvious ties to Chaco Canyon, people in the Red Mesa Valley constructed many smaller great houses, many of which lacked architectural elements common in the canyon. Casamero, for example, lacks the attempt at symmetry that is such an essential characteristic of Chaco Canyon great houses and others found in the San Juan Basin. Instead, Casamero combines elements of local architecture–such as the L-shaped layout–with modestly implemented Chaco features such as small-scale core-veneer masonry.

Even if great houses like Casamero are poor copies of the classic Chaco Canyon great houses, this does not mean that communities in the Red Mesa Valley maintained complete autonomy from Chaco. Considerable quantities of yellow-brown spotted chert recovered from the canyon suggests access to the likely source on Oso Ridge south of the Red Mesa Valley (Cameron 1984, 2001; LeTourneau 1997). Ceramics found in Chaco Canyon with chalcedonic-cemented sandstone temper may have also originated in the Red Mesa Valley (Toll and McKenna 1997), although this temper is in fact very rare at Casamero. And high frequencies of turquoise in the Red Mesa Valley could attest to a connection with Chaco Canyon, one of the great consumers of turquoise, particularly if a suspected source existed in the Zuni Mounains. However, the possibility that residents of Casamero and neighboring communities went to Chaco Canyon, bearing gifts and contributing their labor, is currently unsupported by much more than circumstantial evidence. All of this material instead could have flowed through "middlemen" at places like Kin Ya'a rather than through direct interaction with Chaco Canyon. Nevertheless, even if this was the extent of contact, these connections would have been an important conduit for the flow of information about Chaco into distant communities such as Casamero.

The end of Casamero and other neighboring great house communities is difficult to pinpoint and even more challenging to explain. Similar in pattern seen to the north in the San Juan Basin, the ceramic record in the Red Mesa Valley ends with the influx of modest quantities of early White Mountain Redwares. No later styles are found, suggesting either that the entire area was depopulated during the first few decades of the twelfth century, or that older ceramic styles persevered longer in this area. The former scenario seems the most likely, but the reasons for the depopulation have not been directly investigated. A likely culprit is the sustained downturn in rainfall starting in the A.D. 1130s and lasting until almost A.D. 1200 that was identified by Grissino-Mayer (1996; Grissino-Mayer et al. 1997) in the nearby El Malpais to the southeast of the Red Mesa Valley; only a few years around A.D. 1150 interrupted this drought. However, the fact that people apparently continued to live immediately around El Malpais makes it likely that other factors also were involved in the depopulation. In fact, indirect evidence suggests that at least some residents of the Red Mesa Valley may have migrated into this area, not the least of which is the nearly identical layout of Casamero and the much later Dittert Site on the east side of El Malpais. Perhaps the collapse of Chaco Canyon to the north combined with drought, its impact on local springs, overuse of natural resources, and degradation of farmlands, cast a cloud over great house communities of the Red Mesa Valley and lead the people to look elsewhere to make their homes.

The Future of Red Mesa Valley Research

Much important work has taken place at Casamero and in neighboring communities, but the truism that "the more you know, the more you know you don't know" comes to mind, as many unanswered questions still remain. In addition to the uncertainties about the chronology of the Casamero great house, the positive identification of the nearby great kiva, the curious nature of the compound-masonry walled structure on top of Tecolote Mesa, and the reasons for the valley's depopulation, many questions remain regarding the social, political, economic, and cultural lives of people living along Casamero Draw during the height of the Ancestral Pueblo occupation. For example, how did these communities interact with one another? What are the material differences between great house communities such as Casamero and communities lacking great houses such as Blue J, and what do these differences suggest about regional dynamics?

The archaeological work done at Casamero reported in this volume, at Andrews by Ruth Van Dyke, and by myself at Blue J provides a valuable set of data to work with. The collections for Casamero, Blue J, and many of the individual sites excavated in the Red Mesa Valley over the past half century are available at various New Mexico repositories for future data analysis. The preliminary compositional work that I and my colleagues did using Blue J and Casamero could be expanded, and new, more complex questions asked about the interactions among neighbors, and between them and more distant parts of the Chaco World. Completely untapped are studies such as stylistic analyses of ceramics that might reveal something about identity, while comparative lithic analyses could address exchange relations. The archaeological record of these sites could also be used to address the relationship between the Red Mesa Valley and Chaco Canyon. How are local materials such as Grants obsidian and yellow-brown spotted chert making their way through or around local communities to the central canyon? Can we see production of finished products from local materials–and even from imported shell or turquoise–occurring in local households? Considering how much excavation has occurred in the area, we should be able to develop comparative samples of organic materials to augment studies investigating the movement of maize and trees across the landscape (e.g., Benson et al. 2003; Durand et al. 1999).

Many opportunities exist to build upon the work reported in this volume, and much of this does not necessitate new field studies or even protracted lab analyses. And the results will help us to build a comprehensive picture of what one modestly sized part of the Pueblo Southwest looked like during the Chaco era, providing comparative material similar work conducted elsewhere in the Chaco World. Only through such concentrated and comprehensive field and laboratory investigations will we begin to understand the evolution of the Chaco World–and thus of Chaco Canyon.

Drawings by Carol Chamberland.

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